

The Relative Advantage of Collaborative Virtual Environments in Multichannel Retail

A thesis submitted to The University of Manchester for the degree of Doctor of Philosophy in
the Faculty of Humanities

2014

By

ALEX ZARIFIS

MANCHESTER BUSINESS SCHOOL

Manchester, United Kingdom

Table of Contents

List of tables.....	3
List of diagrams	4
List of figures.....	4
List of appendices	5
Declaration.....	6
Copyright statement.....	7
Acknowledgment	8
Abstract.....	9
CHAPTER ONE – INTRODUCTION	10
1.1 Motivation.....	10
1.2 Aims and objectives	12
CHAPTER TWO - REVIEW OF THE LITERATURE AND DEVELOPMENT OF THE ISSUES TO BE EXPLORED.....	17
2.1 Introduction.....	17
2.2 E-Business and Business Models.....	18
2.3 Collaborative Virtual Environments and Virtual Worlds	23
2.4 Multichannel Retail and strategies	33
2.5 Trust offline, online and in CVEs	36
2.6 The Technology Acceptance Model	46
2.7 Diffusion of Innovation.....	47
2.8 Development of objectives to be explored.....	48
2.9 Objectives to be explored.....	53
CHAPTER THREE – RESEARCH METHODS	56
3.1 Introduction.....	56
3.2 Philosophical perspectives in research.....	56
3.3 Research methodology in E-Commerce	61
3.4 Research design	66
3.5 Conclusion	73
CHAPTER FOUR - QUALITATIVE RESEARCH.....	74
4.1 Introduction.....	74
4.2 Data collection	75
4.3 Qualitative data analysis	80
4.4 Qualitative research findings	82
4.5 Conclusion	100
CHAPTER FIVE - QUANTITATIVE RESEARCH.....	102

5.1 Introduction.....	102
5.2 Data collection	103
5.3 Data preparation.....	106
5.4 Data analysis	108
5.5 Conclusion	108
CHAPTER SIX - IMPLICATIONS AND CONCLUSION	144
6.1 Introduction.....	144
6.2 Discussion of findings.....	144
6.3 Implications for retail companies.....	153
6.4 Implications for research.....	155
6.5 Conclusion	157
6.6 Limitations	159
7.2 Directions for future research	161
References.....	163

Word Count: 54214

List of tables

Table 2.1: Product typologies.....	20
Table 2.2: CVEs and their suitability for retail.....	30
Table 2.3: Identifying the value elements that are enhanced in CVEs.....	31
Table 2.4: Choudhury and Karahanna 2008 key features and literature that can be used to extend it.	52
Table 3.1: Research methods used in B2C e-commerce research.....	66
Table 5.1: Responses to survey questions 1 and 2.....	111
Table 5.2: Responses to survey questions 3 and 4.....	112
Table 5.3: Responses to survey questions 10 and 12.....	112
Table 5.4: Responses to survey question 5 to 9.....	113
Table 5.5: Responses to survey question 11 to 23.....	115
Table 5.6: Responses to survey questions 24 to 37.....	116
Table 5.7: Responses to survey questions 38 to 59.....	117
Table 5.8: Themes of the responses to survey question 60.....	118
Table 5.9: Gender analysis t-tests.....	120
Table 5.10A: Summary of analysis of section 2 of the survey 1/3.....	132
Table 5.10A: Summary of analysis of section 2 of the survey 2/3.....	133
Table 5.10A: Summary of analysis of section 2 of the survey 3/3.....	134
Table 5.11: Comparison of SL to the other channels using t-test analysis.....	140

List of diagrams

Diagram 1.1: Thesis process outline by chapter.....	16
Diagram 2.1: Venn diagram of the areas of literature that contribute.....	17
Diagram 2.2: Venn diagram showing the areas that focus on the options the organization has and understanding the consumer.....	18
Diagram 2.3: Illustration of how the stages, dimensions and types of products come together: Dimension of RA over two stages.....	50
Diagram 2.4: The stages, dimensions of RA and types of retail channel come together	50
Diagram 2.5: Adding the two dimensions of simple and complex products.....	51
Diagram 3.1: Research framework.....	72
Diagram 5.1: Experience in SL compared hours spent per month.....	123

List of figures

Figure 2.1: SL Marketplace with 2D navigation and presentation for 3D products.....	28
Figure 2.2: Basic retail outlet in SL with 3D navigation 2D renderings of products.....	28
Figure 2.3: Advanced retail outlet in SL with 2D and 3D renderings of products.....	28
Figure 4.1: Screenshots of the interviews in Second Life.....	79

List of appendices

Appendix A: Focus group structure.....	182
Appendix B: Interview questions.....	183
Appendix C: Survey questions.....	185
Appendix D: Focus group data.....	204
Appendix E: Interview data.....	226
Appendix F: Survey data.....	247

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Copyright statement

The author of this thesis (including any appendices and/or schedules to this thesis) owns certain copyright or related rights in it (the “Copyright”) and s/he has given The University of Manchester certain rights to use such Copyright, including for administrative purposes.

Copies of this thesis, either in full or in extracts and whether in hard or electronic copy, may be made only in accordance with the Copyright, Designs and Patents Act 1988 (as amended) and regulations issued under it or, where appropriate, in accordance with licensing agreements which the University has from time to time. This page must form part of any such copies made.

The ownership of certain Copyright, patents, designs, trademarks and other intellectual property (the “Intellectual Property”) and any reproductions of copyright works in the thesis, for example graphs and tables (“Reproductions”), which may be described in this thesis, may not be owned by the author and may be owned by third parties. Such Intellectual Property and Reproductions cannot and must not be made available for use without the prior written permission of the owner(s) of the relevant Intellectual Property and/or Reproductions.

Further information on the conditions under which disclosure, publication and commercialisation of this thesis, the Copyright and any Intellectual Property and/or Reproductions described in it may take place is available in the University IP Policy (see <http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=487>), in any relevant Thesis restriction declarations deposited in the University Library, The University Library’s regulations (see <http://www.manchester.ac.uk/library/aboutus/regulations>) and in The University’s policy on Presentation of Theses

Acknowledgment

I would like to thank Rachel and my parents Eugene and Janet for their love and support. I would also like to thank Professor Linda Macaulay, Dr Charalampos Theodoulidis and Dr Kathleen Keeling for their supervision. Furthermore I would like to express my gratitude to Dr Xusen Cheng, Dr Aida Azadegan, Dr Filippo Sladojevich, Dr Kyriakos Parides, Dr Nicos Nicolaou and Dr Alex Rast for their helpful feedback. I am also grateful to the PhD examiners for their time and effort. Lastly I would like to thank Mr Hugh Cameron for offering me the opportunity to teach for three years on three different courses at the Manchester Business School. It was a priceless education in education.

Abstract

Collaborative Virtual Environments (CVE) have been with us for some years however the way people utilise them is evolving and their potential is unclear. This research attempts to achieve a better understanding of retail in CVEs by comparing this channel with the competing retail channels of 'bricks and mortar', or offline, and two dimensional navigation websites (2D websites), in order to identify their respective Relative Advantages (RA). This is investigated from the consumer viewpoint, as they are the ones who will ultimately shape CVEs by voting with their feet, clicks or virtual feet.

By exploring the literature a model was chosen to guide the research. Furthermore, based on this model and other literature five key objectives were identified for further investigation. These objectives are categories of RA that must be explored when comparing retail channels. The first research objective is as follows: A RA of CVEs to the 2D websites for e-commerce may be the aspects of offline retail it includes that do not exist in the 2D websites. The second research objective is: A RA of CVEs retail compared to offline retail may be aspects of 2D e-commerce it includes that are not included in the offline retail environment. The third research objective is: Consumers may vary their intended usage of CVEs across the different stages of the purchase process because the significance of the dimensions of RA may vary across those stages. The fourth research objective is: Consumers' usage of CVEs may be different for simple and complex products. The fifth research objective is: CVEs such as Second Life (SL) may have the RA of a higher degree of institutional trust compared to the 2D websites.

The first stage of data collection used focus groups to clarify the objectives identified from the literature. The second stage involved interviews where these objectives were explored with participants that had relevant experience. Both stages were analysed using template analysis. The first contribution was verifying the relevance of the five objectives and identifying significant dimensions within them. The second contribution was to develop the model used for comparing retail channels by adding enjoyment to the criteria. The third stage of this research is a survey. This quantitative analysis supplemented the two qualitative stages by gauging the significance of the objectives and their dimensions. This enables the findings to be more useful to retailers in making the strategic decisions to achieve the optimum synergies within and between channels. Participants showed a preference for offline and 2D in most situations however there was evidence that enjoyment, entertainment, sociable shopping, the ability to reinvent yourself, convenience and institutional trust were RA of SL in comparison to one of the other two channels.

CHAPTER ONE – INTRODUCTION

1.1 Motivation

This thesis compared retail in Collaborative Virtual Environments (CVE) (Benford et al., 2001), with the 2D websites and the offline world. Retail through more than one channel is referred to as multichannel retail and it is being increasingly embraced by retailers and customers (Bock et al., 2012). CVEs are three dimensional environments online that have also been called virtual spaces, metaverses (Bourlakis et al., 2009) and Virtual Worlds (VW) (Kumar et al., 2008). The CVE this thesis focuses on is Second Life (SL). Second Life has approximately 20 million users (Tanya et al., 2012) and is thus a good platform to explore CVEs. CVEs are predicted to gain wide adoption by 80% of internet users between 2015 and 2020 (Gartner, 2010). For the purpose of this research what is meant by 2D website retail is any retail shop, online with a website offering navigation in only two dimensions. A typical example would be Amazon. By offline retail what is meant is any retail shop that is not on the Internet. There is extensive research into SL which is improving our understanding of this technology and the way people use it. Despite this our understanding of its potential is lagging behind our understanding of that of the 2D websites and it is still considered to be an area of research in its infancy (Tanya et al., 2012). This is for three main reasons: Firstly it is relatively new, secondly it is constantly evolving and the third point, which follows on from those is that both businesses and customers are not clear about how to utilise it. There are strong indications, if not conclusive proof of its potential for socialising and collaboration (Cagnina and Poian, 2009), and conducting exhibitions and conferences, e.g. (SL Actions, 2012). Its potential for retail is not so clear. Is it the future of retail, the next evolutionary step? Or is it a small niche, essentially an online game offering virtual products for use within the game? This is at the heart of what this research attempts to explore.

A suitable way to answer this is to ask users whether they see any Relative Advantage, (RA), in CVEs for retail in comparison to the existing channels, those of the 2D websites and offline shops. Each

channel is in competition with the others in a multichannel environment (Teltzrow et al., 2007). The theory of the diffusion of innovation (Rogers, 1995) suggests that an innovation, in this case the new retail channel, must offer a relative advantage for consumers to adopt it. The extreme success of Facebook (Lusted, 2011), the relative success of Myspace (Gartner, 2008; Lusted, 2011) and the failure of Geocities (Yahoo, 2009), illustrate the importance of understanding peoples' perceptions of innovations' RA.

Central to RA is comparing between alternatives. How to assess alternative options and how to choose between them is an enduring concern for the research community in all disciplines. Rational choice theory, the prevailing framework for understanding social and economic behaviour posits that people reason and assess the advantages and disadvantages of their options before acting. Identifying the RA of an option is an issue for people in their daily lives: Which supermarket should I go to, which city should I live in or who should I elect prime minister? The conventional approach in both natural and social science is to first measure the contending options, or variables using an agreed form of measurement and then compare the resulting measurements. For time and energy efficiencies however people in their everyday lives often avoid measuring things against an agreed form of measurement. They skip that stage, and just compare directly. This is related to the concept of satisficing, combining satisfy with suffice, as opposed to maximisation (Simon, 1956). If someone asks a person if they are taller than their partner, they will not measure themselves and their partner and then subtract the lowest value from the highest to get an answer. They will just take a look, and reply, with complete confidence in their answer and complete ignorance of the heights they have considered. Since this research is interested in how consumers choose between three retail channels we have mirrored this research to focus on how people assess and select between alternative rather than to attempt to understand one channel on its own. The approach of this research is in principle similar to Comparative Case Study Analysis (Ragin, 1987) where two cases are compared in terms of a series of criteria. This is often used in business research e.g. (Bianchi and Rivenbark, 2012; Forbord et al., 2012). The retail channels this research is comparing could be seen as cases that are being contrasted.

The first step in this research was to identify the ideal theory of RA to build on. The one chosen was Choudhury and Karahanna (2008). That research attempted to identify the RA of 2D navigation website retail in relation to offline retail. This research extends that to include CVE. Furthermore Choudhury and Karahanna (2008) suggested additional research needed to be carried out regarding complex and simple products. Lastly they identified their data collection as a weakness, primarily because of the sample size, and encouraged better empirical research on these issues. Beyond extending Choudhury and Karahanna (2008) to CVE this research attempts to address those issues by using superior empirical data. In order for that to be achieved this thesis uses the findings of Choudhury and Karahanna (2008), as a starting point.

1.2 Aims and objectives

As the areas this thesis encompasses are many, the need for clear aims is essential for it to be useful. The research process starts by formulating the right questions and then attempts to find the right answers. However much rigour the second stage has it will not have a useful result if the questions asked are not correct or pertinent. The process of formulating the right aims and objectives was guided by the necessity to contribute to the growth of knowledge. Furthermore the findings had to be useful and directly implementable for retailers. There is an overarching aim that encompasses more specific objectives. The overarching aim is to identify relative advantages of retail in CVEs in comparison to offline and 2D navigation websites. This can be phrased as a research question: What, if any, are the RA of retail in CVE compared to retail using 2D navigation websites or offline bricks and mortar shops?

The context in which this aim is to be pursued is as follows: Unlike 2D navigation websites that are ubiquitous CVEs are not. Therefore a specific CVE needed to be selected that incorporated most of their features. The CVE chosen was SL. The sample that participated was made up of UK residents

with six months experience in SL. The behaviour that was explored was the purchasing process for simple and complex products. This was achieved firstly by identifying the relevant existing literature, identifying ways to add to it, developing a methodology, collecting and analysing data and finally relating the findings back to the literature.

During the extensive literature review Choudhury and Karahanna (2008) was chosen as the foundation of this research. Making the focus neither too broad nor too narrow was of upmost importance and five objectives that captured the issues accurately were identified to guide this exploratory research. The first objective to explore was to assess whether a RA of CVEs compared to the 2D navigation Internet for e-commerce was the aspects of offline retail that it includes, that do not exist in the 2D websites. This objective like the other four is based on applying the findings of Choudhury and Karahanna (2008) to CVEs. Choudhury and Karahanna (2008) state that in order for a new channel to be adopted it must have a RA. Some features of offline retail that CVEs replicate but 2D navigation websites do not may give it an advantage over 2D retail. It would not however be sufficient to have a RA over one of the retail channels if a third was superior in every way. The second objective therefore explores the same topic between the other pair: Could a RA of CVEs for retail over offline retail be aspects of 2D navigation websites that it includes that are not included in the offline retail environment?

The third objective was to explore whether consumers vary their intended usage of CVE across the different stages of the purchase process and whether this happens because the significance of the dimensions identified in Choudhury and Karahanna (2008) vary across those stages. Each channel has certain distinct characteristics and each stage of the purchasing process has distinct characteristics. It is therefore possible that each channel is valued differently depending on the stage of the purchasing process.

The fourth objective was to explore whether consumers' usage of CVE is different for simple and complex products. The consumer approaches a purchase of a simple and a complex product

differently and it is therefore possible that some characteristics of CVEs are valued differently in these different processes.

The fifth objective was to explore whether CVEs such as SL may have the RA of a higher degree of institutional trust compared to the 2D websites. A CVE like SL plays an integral role in the process of making a purchase in many ways such as the way information is conveyed, the payment method and the delivery. It is worth exploring whether this influences the level of trust.

These are the aims and objectives structured into five specific objectives that drive the research and must be covered as comprehensively as possible. The exploratory nature of this research necessitates that beyond these issues there is sensitivity to emergent issues that arise from the data collection and analysis. Issues identified at the start and those that emerge from the qualitative sections are assessed in the quantitative section so that it can be ascertained whether they are a RA of a channel.

1.3 Structure of the thesis

1.3.1 Overview of chapters

The second chapter reviews the related literature. The scope and the approach of this research draw on a number of areas. First these areas are introduced and then the relevant issues to this thesis are drawn out. The first area is e-business and it is explored through business models. These models cover the processes within which the behaviours being explored happen. The second area is CVEs. These are the new type of retail channel within which these models and behaviours are being explored. The third area is multichannel retail in order to develop the ability to compare multiple channels. After that the trust literature is reviewed since this is a parameter that is significant and has distinct qualities in different channels. The penultimate section covers the Technology Adoption Model briefly since it is a useful way to model the purchasing process in a context that includes human-computer interaction. The last area of the literature reviewed is that of diffusion of innovation as it is good at explaining the

adoption of new innovations in general. Lastly based on the literature review five objectives were identified to give the research the right degree of focus.

The third chapter develops the methodology the research will follow so that it can achieve its objectives. It starts by establishing the epistemological perspective of critical realism and the deductive and inductive approaches. It then relates mixed methods to them and briefly discusses its use in the area of e-commerce. The fourth section sets out in detail the actions the methodology will take. The last section outlines the research evaluation.

This fourth chapter covers the qualitative data collection and analysis. This involves focus groups and interviews. The focus groups are used primarily in order to refine the objectives and develop the interview questions. Their secondary use is to reveal any issues that may merit further exploration that were not identified in the literature. The interviews include both specific and broad questions so that they achieve a good understanding of the issues being explored. Like the focus groups they are also open to new issues. The interviews were analysed with Nvivo applying template analysis.

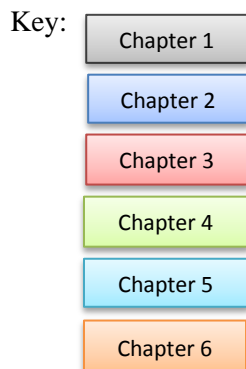
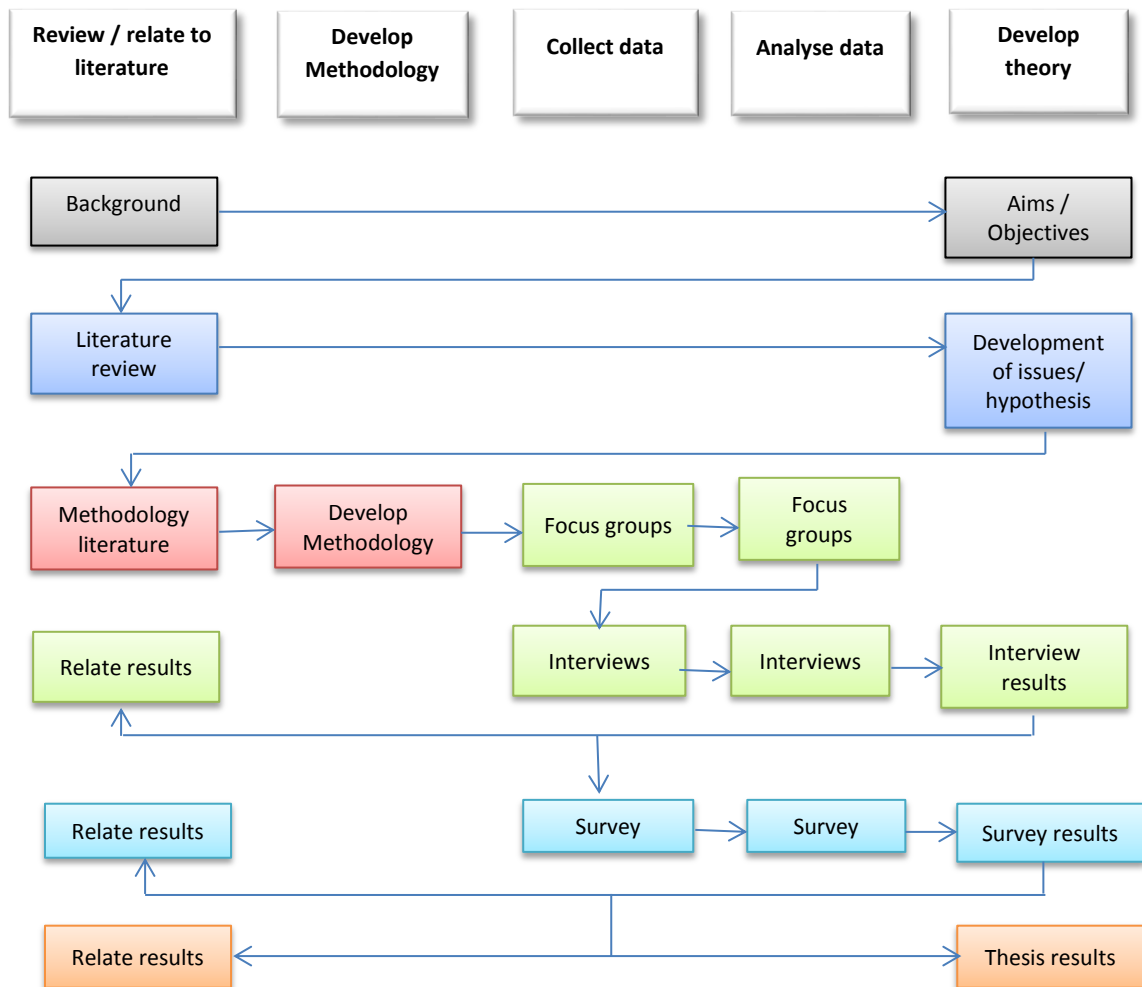
This fifth chapter covers the quantitative data collection and analysis. The survey was conducted by a reputable organization within SL using experienced participants. The data was analysed by descriptive statistics, categorical analysis using the t-test, ANOVA and cluster analysis. The most important issues are compared between channels using t-tests.

The sixth chapter is the culmination of the research drawing on both the qualitative and quantitative findings and discussing the implications and the conclusion. The most important results are discussed further highlighting their significance and use. The limitations of the research which frame the findings and must be taken into account when assessing them are summarised. Lastly avenues for future research are proposed.

1.3.2 Thesis outline

The diagram below illustrates the research process that this thesis covers. Overall the progress of this thesis is sequential but some activities such as relating the findings to the existing literature happen repeatedly. Each colour represents a different chapter:

Diagram 1.1: Thesis process outline by chapter



CHAPTER TWO - REVIEW OF THE LITERATURE AND DEVELOPMENT OF THE ISSUES TO BE EXPLORED

2.1 Introduction

This thesis attempts to compare three retail channels and therefore requires an understanding of a broad range of areas. After extensive research the areas of interest were narrowed down to: e-business and business models, CVEs, multichannel retail and strategies, trust in all three channels, the Technology Acceptance Model and Diffusion of Innovation. The literature of each area is reviewed briefly in order to understand it, to clarify its value and use in general, and to clarify its value and use to this thesis. Each of these areas has made a contribution to the understanding of retail channels and bringing them together attempts to further enhance that understanding either by offering different perspectives, filling in gaps or confirming the validity of each other's findings. The section on e-business identifies what types of business models have been found to be successful online and their characteristics.

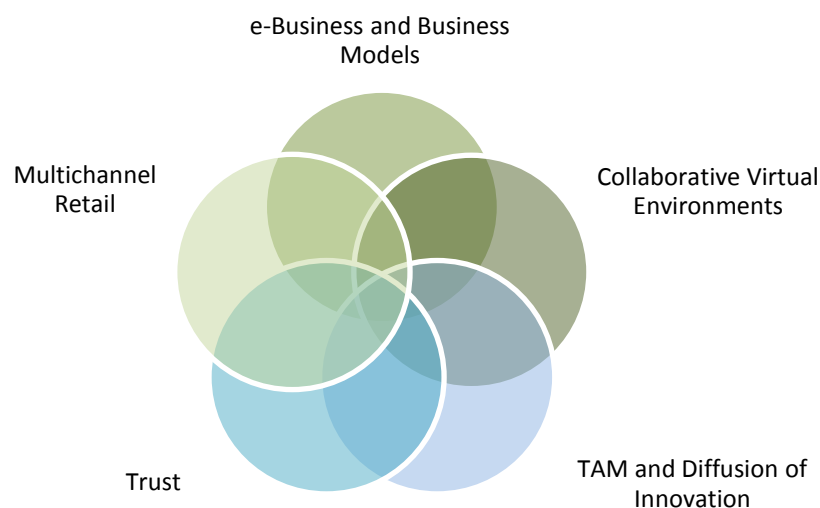


Diagram 2.1: Venn diagram of the areas of literature that contribute

The section on CVEs discusses the characteristics of that channel and the similarities and differences of that channel to other channels. Once CVE have been understood better their relationship to the other channels of 2D online and bricks and mortar are discussed. The Technology Acceptance Model and diffusion of innovation are theories that are useful in explaining how new technologies are adopted and used. Trust is looked at in more detail because it is a complex multifaceted issue that is at the heart of B2C e-commerce. It is useful to consider the first three sections as focused on understanding the organization and the options it has and the later three as focused on understanding the consumer. In the last section the focus of this research and the specific objectives to be explored are developed from the literature review.

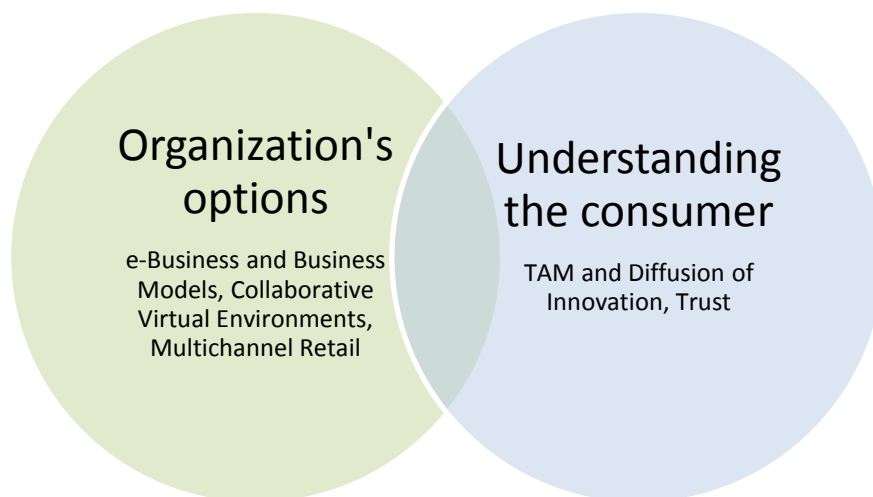


Diagram 2.2: Venn diagram showing the areas that focus on the options the organization has and understanding the consumer.

2.2 E-Business and Business Models

E-business is defined as all internal and external electronically enabled activities including e-commerce (Kalakota and Robinson, 2003). E-commerce is therefore usually considered a subcategory of e-business and is defined as 'digitally enabled transactions between and among organizations and individuals...digitally enabled transactions include all transactions mediated by digital technology' (Laudon and Traver, 2004, p.10). This thesis focuses on retail sales online also referred to as Business

to Consumer (B2C) and therefore excludes Business to Business (B2B), Consumer to Consumer (C2C) and Consumer to Business (C2B) which are also considered to be sectors of e-commerce. Since its first steps in 1995 with companies such as Amazon selling books e-commerce has expanded in significance and complexity. In terms of complexity there are now new functionalities such as enhanced security features and targeted advertising, and secondly new mediums, such as CVEs and mobile commerce (Ghosh and Swaminatha, 2001). Research into this area is therefore useful and pertinent. In this section e-business and e-commerce will be introduced firstly by discussing product types briefly and then by looking at business models in some detail.

At the heart of B2C e-commerce are the products that change hand from the business to the consumer. There are a number of product typologies that enhance our understanding of this important part of the transaction. One typology that is widely used separates products into three categories based on their characteristics from the perspective of the consumer. These three categories are search products, experience products and credence products. This typology was first suggested by Nelson (1970) and has been found to be relevant for online products also (Klein, 1998; Korgaonkar et al., 2006). Search products can be understood in terms of quality before making the purchase. Any information necessary can be provided or deduced before purchasing the product. An example would be a book or a phone. Experience products, unlike search products, need to be experienced by the consumer in order to fully assess their quality. Experience products are sometimes separated into experience 1 and 2 (Klein, 1998). In such a typology experience 1 is as described above and experience 2 refers to a situation where the quality could be assessed without a purchase but this would cost more than the purchase itself. An example of an experience 1 product would be clothing and an example of experience 2 would be a TV. Finally credence products are even harder to assess by the consumer. For credence products the quality cannot be assessed even once the product has been consumed. An example of a credence product could be vitamins. Choudhury and Karahanna (2008) focused on simple and complex products when exploring e-commerce. Simple products are similar to search goods and they also used the example of a book. Complex products have many parameters and may require negotiation. A summary of useful product typologies is given in table 2.1.

Table 2.1: Product typologies

	Title	Product typology	Channel	Key findings
Copeland, 1923	The Relation of Consumers' Buying Habits to Marketing Methods	Convenience goods, shopping goods and specialty goods	Bricks and mortar	Purchasing behaviour is different for different product types
Krugman, 1965	The Impact of TV Advertising: Learning without Involvement	Low involvement and high involvement products	Bricks and mortar	Purchasing behaviour is different for different product types
Klein, 1998	Evaluating the Potential of Interactive Media through a New Lens: Search versus Experience Goods	Search goods, experience 1 goods, experience 2 goods and credence goods	2D Internet	The internet turns experience goods into search goods
Korgaonkar et al., 2006	Online Retailing, Product Classifications, and Consumer Preferences	Search goods, experience 1 goods, experience 2 goods and credence goods	2D Internet	Consumer behaviour differs across product types Search products have the most potential online
Jahng et al., 2001	The Impact of Electronic Commerce Environment on User Behavior: The Case of a Complex Product	Social products, complex products, simple products, experiential products	2D Internet	There should be a 'fit' between the e-commerce environment and the product
Choudhury and Karahanna, 2008	The relative advantage of electronic channels: A multidimensional view	Simple and complex products	Bricks and mortar, 2D Internet	Consumers behave differently for simple and complex products

E-commerce and business models are important in this research during the steps that lead to the findings such as identifying the objectives to explore, collecting data and analysing them. They are however also useful when identifying the implications of those findings and the options for future research in chapter six. The findings can be used to adapt a business model. This is because a deep understanding of the consumer and what they value increases the chances of designing a good business models (Teece, 2010).

Business models together with strategy and process encompass what a company does. They can be seen as the middle tier, of a three tier structure, with processes below them and strategy above them. These three tiers are considered to encompass businesses' activities and therefore the implications must have an impact on one or more of these three tiers. This is also the reason multichannel strategy is explored as that will allow this research to identify its impact on the higher tier. There are various interpretations of the relationship between business models and strategy as in the case of e-business and e-commerce. They are even used interchangeably (Magretta, 2002). The key distinction is that strategy includes the competition an organization faces while as business models are limited to how the business operates (Magretta, 2002) covering the main elements of the firms value proposition (Seddon et al., 2004). A secondary distinction is that strategy encompasses the implementation and execution in contrast to business models that focus on how things work as a system, conceptually (Osterwalde et al., 2005).

While the term 'business model' was first used in an academic publication in 1957 (Bellman and Clark, 1957) the interest in this area from academia and industry started in the late 90s. At this time e-business started to gain traction and broad appeal with pioneers and forerunners like Amazon but there was a high level of uncertainty as to what would be successful. This uncertainty was especially strong since most of the companies did not generate profits and were hence supported purely by investors subscribing to rosy projections. Amazon, one of the e-business pioneers and most successful companies only made a profit in 2002 after having lost 3 billion (Independent, 2002). Recognizing business models that were successful was a useful approach to establishing the characteristics of businesses that could, at least in theory, be successful. There are many parallels with CVEs today. Beyond copying business models that are successful, new business models can be created that utilise the knowledge gained from the previous ones giving a competitive advantage by this incremental innovation (Zott and Amit, 2007).

When academics and practitioners use the term business model they do not always mean it in the same way (Linder and Cantrel, 2000). One prominent definition is: 'An architecture for the product,

service and information flows, including a description of the various business actors and their roles, a description of the potential benefits for the various business actors and a sources of revenue' (Timmers, 1998, p.4). As this definition suggests business models cover both business and technology and there are therefore some more business and some more technology oriented definitions and models (Osterwalde et al., 2005). Timmers (1998) considered the marketing strategy interlinked with the business model and value chains central to both. Each business model is seen as a combination of these value chains. Porter (1985) identifies nine elements of the value chain: Inbound logistics, operations, outbound logistics, marketing and sales, service, support activities technology development, procurement, human resource management and corporate infrastructure. An alternative but similar list of characteristics of a business model is: value proposition, revenue model, market opportunity, competitive environment, competitive advantage, market strategy, organizational development and management team (Ghosh, 1998). While there are many possible combinations of these value elements in effect Timmers (1998) identified eleven models that still apply today. These are the E-Shop, E-Procurement, E-Auction, E-Mall, 3rd party marketplace, virtual communities, value chain service provider, value chain integrator, collaboration platforms, information brokers, trust and other services. Laudon and Traver (2004) separate the business models into four E-commerce sectors B2C, B2B, C2C and P2P. For B2C they identify 7 business models: portal, e-tailer, content provider, transaction broker, market creator, service provider and community provider. A similar but more current list by Rappa (2004) identifies nine models: Brokerage, Advertising, Information Intermediary, Merchant, Manufacturer Direct, Affiliate, Community, Subscription and Utility.

Ostenwalder et al. (2005) found that business models are either value/customer-orientated or activity-role orientated, the former being more relevant to this thesis. An example of a retailer that is closer to the customer orientated model is the Zappo online store (Turban et al., 2011). Osterwalder et al. (2005) considers that there are three levels of abstraction: An abstract overarching concept that summarizes what elements are involved, secondly a classification scheme or taxonomy and thirdly a list of real life business models. Each level of abstraction is more specific and detailed than the one above it. Another related point made by Osterwalder et al. (2005) is that business models are often

used broadly to mean what a business does and other times as a way to model. Osterwalder et al. (2005) also distinguishes between Business Process Model that focuses on the processes a business carries out and business models, the essence of what a company does. These distinctions illustrate the recurring theme in business models of different layers of abstraction. Depending on the nature of each research these issues should be either clarified from the offset or where they arise.

As businesses innovate either in order to utilise new technology or for some other reason business models will evolve. One example of a technology that is influencing business models is cloud computing Weinhardt et al. (2009) and another is mobile computing (e.g. Khalifa and Shen, 2008; Dhar and Varshney, 2011).

In conclusion this brief overview illustrates that business models have many layers and aspects and that there is a large, evolving, number of them. While there are various models and various constituent parts there is some accepted common ground as illustrated by the similarity of those models. An understanding of this context and electronic business more generally is necessary as the data collected for this thesis must be understood within it and the findings will impact it. The findings of this research will not add business models or ‘concepts’ to ontologies. This research focuses on the customer and the value proposition an organization makes to them. Business models are beneficial in analysing and understanding these (Magretta, 2002). Therefore understanding the customer better enables a retailer to offer better value either by adapting the business model or in some other way.

2.3 Collaborative Virtual Environments and Virtual Worlds

Virtual Worlds (VW) are online three dimensional physically persistent environments where people inhabit and interact with other people, software agents and objects through the use of avatars (Guo and Barnes, 2009a; Guo and Barnes, 2009b; Bainbridge, 2007; Davis et al., 2009; Kim et al., 2012). They are also referred to as virtual spaces, virtual social worlds or social virtual worlds (Kaplan and

Haenlein, 2009; Zhou et al., 2011; Mantymaki and Salo, 2011), metaverses (Bourlakis et al., 2009) and Collaborative Virtual Environments (CVEs), (Benford et al., 2001). Social virtual worlds refer to VW where there are no specific goals, sometimes referred to as ‘free-form’ (Hassounah and Brengman, 2013; Bainbridge, 2007). The strength of the term Metaverses is that it does not suggest every aspect of these worlds is virtual. Instead it allows for elements of these worlds to be extensions of the real world (Malaby, 2006). The latter definition, CVEs, has the benefit of being broader but not being used to describe other things unlike the more general VW. A search using the term VW, even in specialized databases will bring both relevant and irrelevant results. Despite this weakness VW does appear to be the most popular term used by related business and information systems publications. Because of the popularity of the term VW and the better accuracy of other terms, VW is often used alongside one of the more specific terms (Bourlakis et al., 2009; Zhou et al., 2010).

2.3.1 Current trends in CVEs

There are VW that focus on gaming but may have a social element most of which are massively multiplayer online role playing games (MMORPG) and others that focus on the social element but may include games such as Second Life and Active Worlds. There are many similarities due to the similar virtual environments and there is research that contributes to both types. This research does not directly incorporate the MMORPGs subset of VW because it is positioned to focus on the fundamental characteristics of retail in three dimensional online worlds. One typology that attempts to capture the key characteristics of each VW proposes the following five elements: Purpose in terms of interaction, place, where that interaction happens, platform in terms of how the interaction is designed, population in terms of the participants and the profit model, how revenue is generated, whether by membership, virtual items or some other way (Messinger et al., 2008). Beyond helping us understand VW the typology illustrates the key characteristics that a VW should have.

CVEs are not an isolated technology or an isolated trend. The functionalities offered to the user to create content and interact in an environment conducive to socializing are part of Web 2.0 and social media. While social media such as Facebook have experienced exponential growth CVEs have had a

more moderate success. CVEs have potential for education, social events, social networking, simulations and advertising but this potential is limited by the number of users (Zhou et al., 2010).

CVEs are attractive to people for a number of reasons most of which are related to taking away constraints that would otherwise be faced (Bourlakis et al., 2009). The elements of the offline world that are needed can be simulated and the limitations can be left out (Kim et al., 2012). Firstly there are psychological needs such as self-esteem, autonomy, physical thriving and money-luxury that can be achieved more easily in CVEs (Partala, 2011). This research also found five themes that motivate people to use CVEs which are self-therapy, instant pleasures, avoiding social norms, self-expression and the appeal for exploration and novelty (Partala, 2011). Shen and Eder (2007) identified perceived usefulness and perceived enjoyment as strong reasons for CVE adoption. Apart from these issues that seem to be more significant in CVEs there is also the importance of virtual communities that is equally important in other online social environments such as forums (Kim et al., 2012). The widely used marketing mantra to build a community around the brand could be paraphrased to build a community in the brand. Novak (2011) also identifies the social context as important considering it to have higher interactivity, a sense of place, an environment that can be manipulated and a more dynamic, active way of learning compared to 2D websites.

The avatar is the person's manifestation in CVEs and is thus central. It is a computer generated image that is controlled by users and represents them when they are interacting online (Nowak and Rauh, 2005). If users can identify with these avatars they are more likely to be satisfied and participate (Kim et al., 2012). This identification can either be with the real self or the ideal self (Kim et al. 2012). Some users enjoy having attractive avatars (Fox and Bailenson, 2009). Beyond the expression of themselves avatars are also the expressions of other people that the user will interact with. This becomes especially important when a shop in a CVE has avatars as salespeople. Avatars in task orientated communications have been found to have the potential to increase trust and in turn patronage (Keeling et al., 2010). Holzwarth et al. (2006) found evidence that avatars as sales agents can enhance the consumers satisfaction with the retailer, make the consumer perceive the product

more positively and be more willing to make a purchase. Work is underway to control avatars in more natural ways such as the users' facial expressions and hand gestures (Han et al., 2012). This along with other technological advancements will make CVEs more immersive, engaging and profitable.

Original content and media play an important role in CVEs. For the same reasons that the term metaverse is used this media in CVEs can be referred to as meta-media (Guitton, 2011). This media has the most positive impact when it combines the unique elements of these three dimensional worlds with more traditional forms such as 2D, asynchronous, written text (Guitton, 2011).

Lastly the dangers particular to CVEs beyond those pervasive to any environment on the Internet revolve around the possibility of them segregating people in various ways such as those that have virtual identities and those that don't, those that belong to a group and those that do not belong to a group (Novak, 2011).

2.3.2 CVEs, B2C e-commerce and Virtual Products

Beyond games CVEs are used today to attend educational courses, building and letting premises, co-creation and innovation, and buying financial services (Verhagen et al., 2011; Kohler et al., 2011; Mennecke et al., 2008; Shelton, 2010). The increase in potential customers has attracted academics, companies and marketers to explore the commercial prospects (Tanya et al., 2012). The current use in addition to the inherent functionalities are evidence of the suitability of such environments for a variety of commercial endeavours including B2C e-commerce. This can include physical products such as Nike shoes sent to the client (Eisenbeiss et al., 2012), virtual products such as virtual Nike shoes, services that are utilized within the CVEs such as hosting a conference and services utilized outside of them such as the aforementioned financial services. The selling of virtual products, sometimes referred to as v-commerce (Kaplan and Hanlein, 2009). In 2011 more than \$700 million was spent on this type of product (Hopkins, 2011). These virtual products are digital and do not exist outside of the CVEs in which they were purchased (Guo and Barnes, 2011). While they may be 3D representations to be used in a 3D CVEs they can be purchased in 2D websites such as SL

Marketplace, in 3D CVEs but from a 2D presentation or in a 3D CVE with a 3D presentation. These three typical retail alternatives are presented in figure 2.1, 2.2 and 2.3.

A number of organizations are currently present in CVEs such as Adidas, American Apparel, Dell, Disney, IBM, Nike, MTV, Toyota and Reebok (Eisenbeiss et al., 2012; Domina et al., 2012). Others, such as Reuters, Wells Fargo, Mercedes and Coca Cola have left. This is either because SL did not achieve the exponential or S-shaped growth some predicted (Gartner, 2007; Lui et al., 2007) or because their specific efforts did not achieve their specific goals. It may be that some of these organizations wanted to explore this medium and will return to SL or another CVE when the numbers of users make it financially viable. Some research suggests that organizations will adopt CVEs if other organizations do the same and are successful (Yoon and George, 2013). This further suggests that there will be a tipping point at some point in the future. More recent predictions estimate wide adoption will be achieved between 2015 and 2020 (Gartner, 2010).

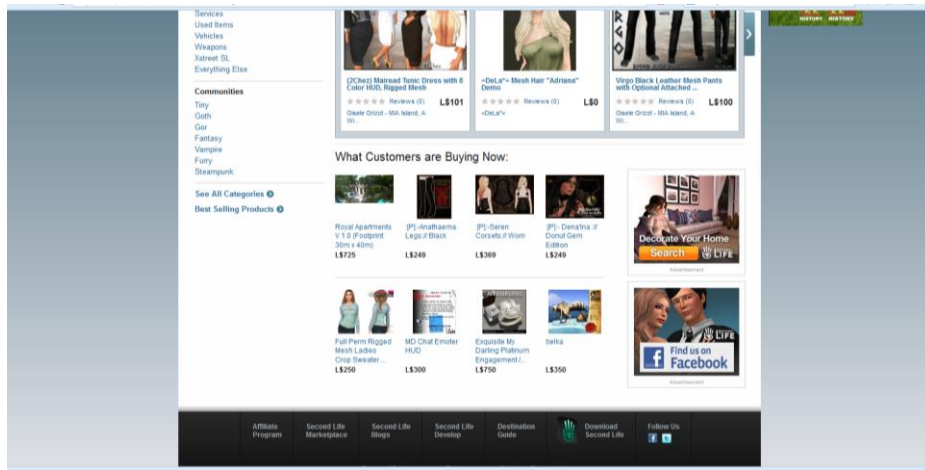


Figure 2.1: SL Marketplace with 2D navigation and presentation for 3D products



Figure 2.2: Basic retail outlet in SL with 3D navigation 2D renderings of products



Figure 2.3: Advanced retail outlet in SL with 2D and 3D renderings of products

2.3.3 CVEs and Business Models

There are hundreds of CVEs, and reviewing all of them is neither feasible nor necessary. What is necessary is to identify their characteristics and how these characteristics impact B2C e-commerce within them. Dividing CVEs into categories can be done by demographic information, such as age, revenue generating method, whether there is a subscription, or the purpose for example game or business. These characteristics of each CVE influence the retail opportunities within them. There is a spectrum of the degree of freedom offered from the CVE owners to residents and businesses populating their worlds. On the one edge of the spectrum is SL which offers a high degree of freedom with Disney's Toontown Online on the opposite edge of the spectrum where businesses are not allowed to operate and there are even limitations on communication. CVEs and their suitability for retail are summarized in table 2.2.

When considering the B2C e-commerce potential of CVEs it is beneficial to use the business models discussed in the previous section, 2.2. These businesses models are only possible in CVEs like SL that offer sufficient freedom. If the nine models proposed by Rappa (2004) which are Brokerage, Advertising, Information Intermediary, Merchant, Manufacturer Direct, Affiliate, Community, Subscription and Utility, are considered all could potentially be successful in CVEs. Advertising and marketing in general have shown that CVEs are conducive to their effectiveness as users can be more engaged and this offers enhanced opportunities (Tanya et al., 2012; Bulearca and Bulearca, 2012). The central issue is what benefit would there be in applying them to CVEs. A similar predicament faced Timmers (1998) when considering the benefit of e-commerce to offline. This comparison between channels is central to this research and will be continued in the next section, 2.4.

To start this discussion and explore the issues related to business models in CVEs Timmers (1998) will be extended onto them. Out of the 11 models there are 7 that seem more significant in CVEs: E-Shops, E-Auction, E-mail, 3rd party marketplace, virtual communities, collaboration platforms and information brokerage. The comparison between the two channels is made in table 2.3. The first obvious advantage is that these businesses in CVEs can also be involved in virtual products. Virtual

Table 2.2: CVEs and their suitability for retail

Name	Degree of freedom	Subscription	Age group	Game orientated?	Virtual currency	Suited for retail?
Second Life	High. (Own land, create content, host on private servers)	Free and paid subscription.	Teenage and adult worlds.	No. (Socialising, exploring, conferences, art, adult)	Yes. (Linden dollars)	Yes.
Active Worlds	High. (Claim free land, purchase planets, create content from predefined shapes)	Free and paid subscription.	Adult.	No.	No.	Yes.
Entropia Universe	Limited. (Can purchase planets)	Free and paid subscription.	Adult.	Yes. (Acquire wealth by completing tasks and fighting)	Yes. (Project Entropia dollars)	No.
There (Closed 2010)	High. (User generated content)	Free and one off payment membership.	For 13 and above. (PG-13)	No. (Socialising and exploring)	Yes. (There bucks)	Yes.
Habbo Hotel	Low. (customize rooms by purchasing furniture and pets)	Free.	Teenager.	No.	Yes. (Habbo credits)	No.
Club Penguin	Low (Even in chat a limited range of phrases can be used to avoid inappropriate things being told to children)	Free and paid subscription.	Children.	Both game and social.	Coins earned in games.	No.
Webkinz World	Low, focus on achieving tasks.	Free and paid via the purchase of a toy.	Children.	Both game and social.	'Gems' harvested to buy virtual items along with real money.	No.
Disney's Toontown Online	Low. (Cannot create content)	Free or paid subscription.	Children.	Yes.	No.	No.

products can be considered an extension of existing models or a new business model itself (Wu 2007).

While some businesses are in CVEs purely to sell virtual products and not because of any particular benefits the medium offers, other businesses are there to utilise the particular benefits of the medium.

An example of the benefit of the medium is its social nature and the ability to create social capital (Barnes and Pressey, 2011). A related benefit is the sense of community developed (Ching et al.,

2011). The different nature and benefits of these business models can be illustrated by considering the value chain elements they include.

Table 2.3: Identifying the value elements that are enhanced in CVEs

Business model	Benefit of use in 2D Internet (according to Timmers, 1998)	Benefit in CVEs	Enhanced by medium
E-Shop	Promotion, cost-reduction, additional outlet.	Promotion, additional outlet. Virtual products.	Promotion.
E-Auction	Electronic bidding (no need for goods or partners to move).	Same.	No.
E-Mall	E-Shops with aggregators, industry sector marketplace.	Same.	No.
3 rd party marketplace	Multiple businesses using the same frontend and transaction support and marketing.	Same.	Yes. (CVEs have some of the elements of 3 rd party marketplaces.)
Virtual communities	Enhancing the value of the communication between members.	Same-but more focus on socializing.	Yes.
Collaboration platforms	Enhance collaboration.	Same.	Yes.
Information brokerage	Includes customer profiling and marketing in general	A different and potentially more limited demographic, more immersive experience	In terms of engagement

It is therefore useful to focus on value when relating business models to CVEs. Value has been central to business from their early days with value chains proposed by Timmers (1998). Timmers discussed how models could be constructed from value chains such as inbound logistics, operations, outbound logistics, service, marketing and sales. Since that research many contributions to the literature of business models were made (Linder and Catrel, 2000; Rappa, 2001; Afuah and Tucci, 2003, Rappa, 2004; Lazonick, 2009) all of which can be applied to CVEs to gain some insight. The most pertinent here is Cagnina and Poian's (2009) contribution because it was focused on CVEs. Cagnina and Poian (2009) identified the use and limitations of the previous models and attempted to capture the value drivers of each CVE and how this impacted the value chain of the business models within them. Therefore, Cagnina and Poian (2009) can be used to bring the literature of business models and that of CVE together. The value drivers proposed are Achievement, Control, Creativity, Sociality, Realism and Membership. These value drivers of CVEs are very different to the value chains originally identified for 2D navigation websites by Timmers (1998). Firstly they are value/customer-orientated as opposed to activity-role orientated (Ostenwalder et al., 2005) and secondly they are more representative of how people perceive CVEs today. The benefit of Cagnina and Poian (2009) would be firstly to assist companies in choosing their business model but secondly beyond that, in far finer granularity, how to 'play to the strengths' of the medium chosen. The understanding and utilizing of these new values and the comparison and choice between channels would benefit from more consumer focused research on these issues.

2.4 Multichannel Retail and strategies

Multichannel retail covers the activities involved in selling products and services to consumers using more than one channel (Levy and Weitz, 2009). This process has implications for many aspects of an organization such as legal, bookkeeping, enterprise systems, human resources, new product development, servicing and corporate marketing (Rangaswamy and Bruggen, 2005). The most common retail channels are bricks and mortar, online 2D website, online virtual world, catalogue, call centre and television retail. The first three are explored extensively in this thesis. Distinctions can also be made within channels. One example would be a retailer that sells through their website and Ebay. A second example of distinctions within a channel is a business selling through their own bricks and mortar shop or selling through a bricks and mortar shops managed by another business. These distinctions can be considered as channels within channels and are not the focus of this research. By the turn of the century organizations were either already focused on multiple channels or they were moving in that direction linking all their channels together (Haydock, 2000). Today it is considered the dominant approach to retail (Zhang et al., 2010). This can be seen in many industry sectors other than retail such as travel, banking, computer hardware, computer software and manufacturing (Kumar and Venkatesan, 2005). It is important for an organization to coordinate the channels it uses (Yan et al., 2011) in order to achieve the best results, first for the customer and then for themselves.

Each channel has certain advantages and disadvantages. For a channel to survive in the highly competitive environment that exists today it must have some form of an advantage. Online retail, or B2C e-commerce, has certain advantages and disadvantage compared to other channels. The main advantage is convenience (Chang and McFarland, 1999). The main disadvantages are: Firstly requiring the necessary experience to use online stores (Bellman et al., 1999) and secondly the lower level of trust in comparison to bricks and mortar shops. Trust is discussed in the following section 2.5.

Research in this area suggests it is important to take a customer and not a channel centred view (Schoenbachler and Gordon, 2002). This thesis follows this assertion. This does not mean that understanding each channel is not important but rather that any final conclusions must depend on customer's views not a list of channel features. In other words what drives customers in relation to retail channels (Schoenbachler and Gordon, 2002). Research suggests that multichannel consumers' behaviour and channel choices are more strongly influenced by psychographics than demographics (Konus et al., 2008).

There is evidence that suggests that customers who use multiple channels often have different characteristics than those who only use one channel. They come into contact with the company more regularly, purchase more regularly; have deeper relationships and harbour more trust (Kumar and Venkatesan, 2005). The same research considers one reason for this is a better awareness of what the company has to offer (Kumar and Venkatesan, 2005). Some evidence suggests customers of bricks and mortar shops tend to be more loyal (Konus et al., 2008). The same research also found that multichannel shoppers enjoyed shopping more than their counterparts that just shopped offline (Konus et al., 2008). One of the behaviours identified in multichannel research is seeking information on one channel and purchasing on another (Dholakia et al., 2010; Heitz-Spahn, 2013). This has been referred to as cross channel free-riding and is clearly not to the benefit of the vendor who did not make the sale (Heitz-Spahn, 2013). It is important to point out that some of the research here such as the aforementioned explored two channels not three. Research into market maven behaviour across three channels found that such mavens tend to have the same behaviour across them although their propensity is influenced by the nature of the channel (Barnes and Pressey, 2012). If a channel is commonly used for a specific purpose then they will engage in this specific purpose more strongly.

There is evidence that consumers prefer different channels for different actions (Schroder and Zaharia, 2008). Searching for information about a purchase such as price, and making a purchase have differences and different channels may be preferred for each stage (Noble et al., 2004). Each channel

is found to have different utility (Noble et al., 2004). Additional distinctions are examining and picking up the product that is being considered for purchase (Berman and Thelen, 2004). This thesis explores all of these stages. From the retailers perspective there are other processes such as stock keeping, logistics and dealing with vendors (Zhang et al., 2010) but these processes are not explored in this thesis.

Discussion of multiple channels inevitably leads to strategy and business models. Synergies are often sought out when making strategic decisions but in multichannel research they are a priority (Schoenbachler and Gordon, 2002) and must be based on the customer's perspective (Schoenbachler and Gordon, 2002). With all strategic decisions resource allocation is important and this is also the case in multichannel strategies (Noble et al., 2004). Once each channel's advantages and disadvantages are understood an organization would move on to assessing which ones to use and how to use them together. For example would an organization want to offer the same functionality and products through different channels or would the organization adapt their presence to each channel in order to utilise that channel. Making these choices correctly can lead to an increase customers, revenue and market share (Berman and Thelen, 2004).

There are a multitude of different strategies but they can be considered to be on a spectrum between entirely homogenized channels and entirely separate offerings. Some examples of multi-channel strategies with less homogenized offerings are: Offering more products on the online shop than the bricks and mortar shop because a company may have one warehouse that serves the online orders and that makes stock management easier and cheaper than in the case of the bricks and mortar shops. A second strategy is to offer more specialized products that sell in smaller numbers online (Berman and Thelen, 2004). If the strategy would involve having a different approach to each channel then it may also incorporate an attempt to migrate from one channel to the other (Dholakia et al., 2010).

A more homogenous strategy would attempt to better achieve a coherent brand, product and service offering across channels regardless of their particularities (Yan et al., 2011). This coherence also reduces the risk of causing confusion and dissatisfaction with different prices, products, services (Konus et al., 2008) and return policies including returns to different channels. Will a salesperson in the Nike store in Manchester be able to help if a Second Life customer cannot virtually wear the virtual Nike shoes? In most cases if not all the answer will be no. Having a coherent offering does not necessarily completely exclude adaptation to a channel. This should not be excluded entirely because, as has already been mentioned, there is evidence that consumers prefer different channels for different actions (Schroder and Zaharia, 2008). It is clear that choosing the right point on the spectrum between homogenization and an entirely different offering is important and far from straight forward (Zhang et al., 2010). This process has been referred to as harmonization of the channel and has been considered to be a craft (Zhang et al., 2010). The word craft was chosen to suggest this is not a problem for which a solution can be offered but a number of decisions that should be supported with greater understanding. This short overview of multichannel retail illustrates their relationship to business models, trust and the benefit of taking a consumer centric view.

2.5 Trust offline, online and in CVEs

In every aspect of our daily lives we are required to trust people and to be trusted. The way we do this is complex and there are many models that attempt to explain it. What runs through most of the models is the importance of the cues we get from others in this process. In our online life trust plays a similar role but the cues are different and far less. Therefore this new context and the new processes it dictated brought with it a gap in our understanding that research primarily from 1998 to this date has attempted to cover. The proliferation of CVEs such as SL had created a new context once again, with the inevitable gap in our understanding this entails. This new contexts brought with it richer interpersonal interaction and thus more cues. Therefore it draws from the 2D websites, the offline

world and possibly adds entirely new parameters. This means that in order to get a more nuanced understanding we need to relate existing literature to this area.

The review of trust concentrates largely on Business to Consumer, or buyer-seller relationships. The first section reviews the foundations of trust primarily in psychology and sociology. The next section covers the more general theories that are associated with it. The penultimate section discusses the prominent models in the context of e-commerce and CVEs. Lastly the conclusion summarises the key findings from each area.

2.5.1 Trust offline

2.5.1.1 Foundations of Trust

It is important in this broad topic with many research streams to be clear on the definition, stream of research, theory and model that is most relevant. A popular definition by Mayer, et al. 1995 states: ‘trust is an individual’s general willingness to trust others, and actual trust or trusting behaviours’. This definition’s key contribution and possible reason for its popularity is that it alludes to a composite trust, constituted of ‘willingness’ and ‘behaviour’. This distinction is widely made with similar constituent parts, for example ‘trusting beliefs’ and ‘trusting intention’ (McKnight et al., 1998). A second more detailed definition from the same research is also useful: ‘the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party’ (Mayer et al., 1995, p.1). This definition highlights the inability of the trustor to monitor or control the trustee which is important in all cases, especially in the online environment. This inability and the trustor’s perceptions of it are at the heart of research into trust. These definitions are however still quite broad. A more succinct definition offers the focus necessary: ‘a willingness to rely on an exchange partner in whom one has confidence’ (Moorman et al., 1993). This definition is preferred as

it is compatible with trust in business to consumer or buyer-seller relationships that involve transactions.

The definition comes from the marketing stream of research into trust where the focus is on distribution channels such as that of the manufacturer-retailer and the buyer-seller (Wang and Emurian, 2005). Another discipline that has researched trust extensively is Management where the focus has been on the organizational context (Kramer, 1999). The Marketing discipline is closest to the focus of this thesis but it builds models based on theories from psychology and sociology. Psychologists, such as for example Rotter (1971; 1980) usually focus on trust as an individual characteristic. Therefore the personality's characteristics and thus personality based trust which we will discuss later are central themes.

Sociologists and often economists consider it to be an expectation of the behaviour of others in a transaction. They focus on the contextual aspects which impact trust (Lewicki and Bunker, 1995). A useful insight to take from the sociological research stream of trust is the importance of trust coming from social relations. It is considered to be more prominent in economic relationships than either intrinsic morality or institutional trust (Granovetter, 1973). Granovetter (1973) also proposes that economic relations between people and organizations are embedded in social structures and thus biased by them. This indirect impact that sociologists suggest (trust - social relations - economic relations) and the direct link (trust - economic relations) may not be in disagreement but simply relevant in different situations. In Business to Consumer relationships the direct link would come into play as well as the indirect link which may be more prominent in Business to Business relationships. Collaboration platforms such as forums and CVEs allow socialisation online and thus this aspect should still be relevant. Therefore the ways in which different contexts such as electronic commerce and CVEs influence these social relations also influence trust. This is still relevant even in this thesis that has a narrower focus of trust in Business to Consumer relationships. Therefore it could be argued

that a context that better enables and reinforces social relations would reinforce trust. It is not however immediately obvious which of the two contexts that interest us do that.

2.5.1.2 Singular and Multivariate Trust

Most researchers identify two constituent parts of trust. Pearce (2007) identifies them as ‘trustworthiness’ and ‘trusting behaviour’. The first represents a decision on whether the individual is trustworthy based on the cognitive stream of trust theory which will be discussed in the next section. The second represents acting in a trusting way, with or without reaching that cognitive decision on trust worthiness. McKnight et al. (1998) uses similar constituent parts, those of ‘trusting beliefs’ and ‘trusting intentions’ and also considers them to be based on the cognitive trust theory. Further analysis of these constituent parts is of limited value without specifying the situation, theory and model of trust used.

2.5.1.3 The five main approaches to explaining trust

These approaches are either used in isolation or in combination as antecedents (McKnight, 1998; Walczuch and Lundgren, 2004) to explain trust in different situations. They are: Cognitive, Knowledge, Calculative, Personality based and Institution. A brief discussion of them follows:

Cognitive based – cognitive trust: This trust theory considers the degree to which an individual assesses the ‘trust-worthiness’ of someone subjectively (Pearce, 1974). It is important to clarify that these cognitive processes are based on initial impressions not relationships with repeated interactions.

Knowledge based: This theory proposes that trust develops as knowledge develops to supports it. Therefore the trustor attempts to predict the behaviour of the potential trustee. This knowledge may include potential incentives and punishments as well as previous behaviour (Bhattacharaya et al.,

1998). Shapiro et al. (1992) adds that the knowledge gained must be enough to predict the others behaviour. In knowledge based trust as with 'identification based trust' there are benefits from better information flows (Fisman and Khanna, 1999).

Calculative based: This theory suggests that when an individual or organization has to decide whether to trust calculations are made of the cost and rewards the trustee faces in fulfilling what would be agreed, for example (Doney and Cannon, 1997). The decision to trust is made if the perception is that the benefits of fulfilling what is agreed outweigh the losses of not doing so and the danger of getting caught. This is a popular theory in economics (Williamson, 1991).

Personality based: This is supported by personality psychologists. They consider trust to be a characteristic of the individual, thus playing down the situational factors (Bhattacharya et al., 1998). This willingness to trust is cultivated during a person's childhood by supportive parents. The personality traits are considered to be extraversion, neuroticism, agreeableness, conscientiousness and openness to experience (Walczuch and Lundgren, 2004). This theory is complementary to theories on the disposition to trust that will be discussed later. Research has shown that the personality of a person impacts the way decisions are made to trust online (Lumsden and MacKay, 2006) with extroverts being more susceptible to 'trust triggers' and less susceptible to stop trusting after a disappointment. Since our focus is trust in a new context a theory that does not focus on the situational factors cannot form a basis on its own.

Institution based – institutional trust: This means that structures in place aid a positive outcome for the person considering whether to trust (McKnight et al., 1998). Focusing on the Business to Consumer implications Pavlou and Gefen (2004) consider it to be the buyers perception that effective third-party institutional mechanisms are in place to support a successful transaction. These third party mechanisms vary from 'weak' ones like transaction facilitation offered by PayPal, certification such as Verisign and enabling feedback to 'strong' ones such as the legal framework (Pavlou and Gefen, 2004). The mechanisms that form an institution can also be seen as formal or informal. An example of

a formal institution is the legal framework already mentioned, and examples of informal institutions are communities or group ties (Wang and Gordon, 2011). Formal and ‘strong’ institutions have a greater impact than ‘weak’ or informal institutions (Wang and Gordon, 2011). These examples also illustrate that some of these mechanisms exist in a context regardless while others depend on individual endeavours. This is useful to consider as a new context, such as CVEs will have some of these mechanisms as standard, while others could be introduced. From the five approaches this is the most relevant and useful to this thesis.

2.5.1.4 Related theoretical models

The key theories that researchers relate to trust will be reviewed briefly. The first is the expectation confirmation theory (Oliver, 1980) that suggests that consumers form an expectation of the quality, value or performance of a product before they receive it that is then contrasted to their actual experience with it.

Social Exchange Theory by Thibaut and Kelley (1959) applies a Rational Choice perspective to social exchanges suggesting people commit voluntary and trusting actions in the expectation that the benefits received will outweigh the effort initially exerted. The Social Network Theory describes social relationships between organizations or an individual as a structure comprised by a series of interconnected nodes. These nodes are interconnected by some kind of interdependency such as friendship or trade. Kim and Prabhakar (2000) use this theory to assess initial trust.

The Agency Theory and principal-agent problem that was developed from it are used in Economics. Its central concept suggests there is a principal that has requested something from an agent. The principal ‘hires’ the agent who in turn must ‘perform’ something. Both parties however have personal interests. The problem arises when there is an information asymmetry between the two. This theory has been used in buyer-seller relationships in which the buyer is the principal and the seller is the

agent (Pavlou et al., 2007). Since this information asymmetry is prominent in e-commerce this perspective is useful.

The next theory, the Theory Reasoned Action, (TRA), comes from social psychology. It was proposed (Fishbein and Ajzen, 1975) as a way of explaining and predicting behaviour. It suggests that the behavioural intention is a strong determinant of behaviour. This behavioural intention is formed by the individual by combining their attitude and the subjective norms towards that action (Fishbein and Ajzen, 1975). Attitude is the sum of the beliefs a person has about an action and the associated weights they would allocate to them. Lastly the subjective norms are determined by the beliefs of other people whose opinion the person in question values.

The value and limitations of the TRA led Ajzen, one of its co-authors, to attempt to improve it with the Theory of Planned Behaviour. The value was that the two variables did impact behaviour and the limitation was that they did not sufficiently predict behaviour. Therefore there seemed to be a missing variable that was considered to be an individual's perceived behavioural control (Ajzen, 1985; Ajzen, 1991). This means the degree to which a person believes they can complete an intended behaviour successfully would impact their intended behaviour and thus their actual behaviour. This seems logical and intuitive. The key contribution of this variable is that it allows the original model to perform in cases where the individual does not have control over the environment in which the behaviour will take place and thus may not have control over the outcomes. The new variable that was added drew from an existing, widely used concept, that of self-efficacy, which comes from the social cognitive theory (Bangura, 1977). Self-efficacy is the belief a person has in his or her ability to plan and carry out actions which will achieve his or her goals. TRA and TPB are used to analyse both trust and the Technology Acceptance Model, TAM, which will be discussed in section 2.6. This enables trust to be used with TAM.

2.5.1.5 Temporal dimension: Trust in different points in a relationship

One aspect of this multidimensional issue is the point in a relationship that trust is being considered. Extensive work identifies three key points: Before the relationship in question starts, hence a disposition to trust inherent in a person (Akhter, 2004), the initial state, usually before a transaction is made or a product received (McKnight et al., 1998), and the long term state, after a product is received and some time has passed (Shapiro, 1992). These three states are valid in a variety of situations and not limited to a purchase that is our specific interest.

2.5.2 Trust in electronic commerce

We have seen the importance of this construct in human relationships. It has been important since the beginning of civilization. A new context was introduced with the Internet and e-commerce that required our understanding on trust to be further developed. Since the customer can no longer see or feel the actual product the need for trust is more profound. Most of the research in this area epitomised by the key publications (Jarvenpaa et al., 1998; McKnight et al., 2002; Gefen, 2002) agree in the importance of this construct for e-commerce to be successful.

We will start by briefly discussing the most useful contributions of McKnight et al. (1998) which have also been mentioned previously as part of the first section. This model is representative of a large volume of research in trust that build models for specific contexts using some of the five theories or antecedents of trust discussed (Kim and Prabhakar, 2000; McKnight and Chervany, 2002; McKnight et al., 2002, Walczuch and Lundgren, 2004; Zhang and Zhang, 2005; Krauter et al., 2006). This research takes into account the relevant theories to initial trust. These are disposition and institution theories and they are used as antecedents here. It also includes a composite trust comprising of trusting beliefs and intention which is broadly accepted as we have discussed. Within the findings it is emphasized that the person's perception of the situation, and thus institution based trust, must be empirically measured as assumptions based on theories are not sufficiently reliable (McKnight, et al.

1998). Another useful finding is the distinction between ‘trust levels’ and ‘trust fragility/robustness’ (McKnight et al., 1998). Lastly McKnight et al. (1998) suggests that assessing initial and long term trust are two fundamentally different things.

After discussing research that had useful contributions to investigating initial trust the next step will be to look at research on long term trust. Pavlou et al. (2007) carried out research into mitigating uncertainty, which includes trust, in online relationships. Firstly a distinction is made between low level and high level involvement (Pavlou et al., 2007). This research goes on to create a model and tests it. The model includes uncertainty mitigators and uncertainty antecedents. This model, in contrast to that of McKnight et al. (1998) and similar ones is easier to act on. This is because the reason that the principal agent perspective is applied is that the antecedents of trust in this research are not the same to the main body of trust. They involve perceived information asymmetry, fears of seller opportunism, information privacy concerns and information security concerns. These variables are valid but cannot be easily incorporated into the models and theories commonly used. Furthermore the model proposed by Pavlou et al (2007) is not as widely used and developed as those related to McKnight et al. (1998).

2.5.3 Trust in Virtual Worlds

Researchers were quick to identify that Virtual Worlds would have potential to offer benefits for many different purposes. This on-going research however has not yet brought our understanding of e-commerce in VW to that of other non-VW online businesses. This shortage is especially evident in empirically based research. One reason for this is the limited financial activity at this point in time. There are reservations voiced about the longevity of making profit from virtual items (Noam, 2007) because they can be copied and there is a limited legal framework, at least in SL. The most financial activity is in the ‘real estate’ market primarily by the owners of VW selling land and islands. This is the sound business model of buying developing and reselling land (Noam, 2007). Firstly all of these activities are considered Business to Business and thus outside the scope of this thesis. As with the

early days of the Internet it is hard at this point to separate the gimmicks from the real business opportunities and models. At the same time there are the successes such as the volume of work IBM conduct in SL having thousands of employees working there. Despite both the positive and negative evidence to date the most important issue is not what has happened but it is the potential of what could happen in the future.

Regarding trust in this context one report suggests that because people interact using avatars the sociological and psychological paradigms used are not valid in this context (Junglas et al., 2007). Since the foundations of trust are in sociology and psychology this suggests that transferring the existing knowledge will not be straightforward and there is therefore a need for empirical evidence in this new context. This research suggests the key areas of behaviour which may be different are: (i) identity formation, (ii) learning styles and (iii) trust. The importance of this is compounded for trust as the first two variables also influence it. Further research on VW attempts to answer the question why people buy virtual items (Guo and Barnes, 2009a; Guo and Barnes, 2009b). A model was developed using TRA, TPB the Web Trust Model, (McKnight et al., 2002), TAM, and the Unified Theory of Acceptance and Use of Technology (UTAUT). The resulting model includes a composite trust which incorporates the five types, or antecedents to trust that have been discussed. It is therefore evident that VW and retail involving virtual products create a need to trust. The role of trust may be higher because the VW and the virtual product are two additional dimensions that the consumer must trust for the transaction to happen.

Another report on E-Business in VWs briefly discusses how the ‘dynamic, participative and emotive’ environment (Berger et al., 2006) offers opportunities to e-business. That ‘dynamic, participative and emotive’ environment (Berger et al., 2006) may be of interest to e-business in general but it is also of interest to trust specifically. Such an environment offers more cues, similarly to the offline world thus potentially increasing trust. The level of emotions which can be conveyed in VW will increase as facial expressions of the user and eventually superimposed video images of the user’s avatar will be streamed. If we look back at the types, or antecedents to trust: Cognitive, Knowledge, Institutional,

Personality and Calculative and recall that McKnight et al. (1998) emphasised selecting the right ones to include in a model depending on the context it is easy to conclude that the different level of emotiveness communicated will impact trust and the way it is modelled. One possible impact would be for the increased communication made possible in CVEs to reinforce knowledge based trust. Lastly CVEs are distinct organizations and environments as opposed to the generic Internet with different issues impacting institutional trust. Many features such as the payment method are standardised across these organizations unlike the Internet where every website may use a different system. This change in the nature of how trust is formed comes in addition to the new needs for trust which we saw in the case of virtual objects. The significance of the institution within which the purchase is made means institutional trust is the most relevant aspect of trust to this thesis.

2.6 The Technology Acceptance Model

While bricks and mortar shops cannot be considered to be a technology regardless of the technology they use the other two channels 2D navigation websites and CVEs are most definitely technologies regardless of the business issues also present. The literature on the adoption of technologies is useful to this thesis, especially since it underpins Choudhury and Karahanna (2008) that is the research used as the starting point of this thesis. TAM has been found to be a useful theory to cover the acceptance and use of VW (Zhou et al., 2011; Fetscherin and Lattemann, 2008; Mantymaki and Salo, 2011; Yeh et al., 2011; Tanya et al., 2012). It has also been found to be useful to determine users' acceptance of electronic products known as e-products (Tanya et al., 2012). This section gives a brief overview of TAM. TAM is discussed further in the last section of the literature review.

The Technology Acceptance Model, TAM, was proposed by Davis (1989), Bagozzi and Warshaw (1992). It was an extension of the Theory of Reasoned Action (TRA) discussed in the previous section on trust, in order to apply specifically to technology adoption. It has since been continuously adapted and extended. The principle behind TAM is that intention to use technology is a good determinant of

the actual use of technology. This is significant as it means data collected from interviews, surveys and other methods apart from the actual use of a technology are useful in predicting that use. The intention to use is in turn influenced by Perceived Usefulness and Perceived Ease of Use. This relationship between usefulness and ease of use ensures that a technology is not rated higher just by adding more functionality, or by just simplifying it. It encourages high functionality with ease of use examples of which can be found in many successful broadly used technologies from Ebay to the Amazon Kindle.

2.7 Diffusion of Innovation

Innovation is defined as ‘an idea, practice, or object that is perceived as new by an individual or other unit of adoption’ (Rogers, 1983, p.11). Diffusion of innovation refers to the adoption over time of an innovation and is defined as ‘the process in which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 2003, p.5). The concept was first proposed in 1890 (Tarde, 1890) but it was not until Rogers (1962) developed those ideas further that they drew broader interest outside sociology in other areas such as business. Rogers developed this theory after observing over 500 cases. This theory has been used and tested for fifty years. A brief overview of this theory is included here as the work of Choudhury and Karahanna (2008) that forms the basis of this thesis uses an element of it. The theory of innovation has been used to explore behaviour in VW such as SL (Chandra and Leenders, 2012; Tanya et al., 2012)

Rogers identifies four elements to the adoption of an innovation: The innovation, communication channels, time and the social system. There are five stages considered: Knowledge, persuasion, decision, implementation and confirmation. The five factors of an innovation that influence its success are: The Relative Advantage, Compatibility, Complexity, ‘trialability’ and ‘observability’. The construct of Relative Advantage is used by Choudhury and Karahanna (2008) to compare between retail channels. Using Relative Advantage avoids having to compare things in every way and

assessing them in their totality. The focus, instead, is on the most important issue, whether they have something better than their predecessor or competitor. This variable or construct is not complex or hard to understand so the main purpose of this brief overview of its origin is to illustrate the support for its validity.

2.8 Development of issues to be explored

In order to answer the research question, what, if any, are the relative advantages for CVEs for retail the first step was to identify a model or theory which could help assess retail in CVEs. Since CVEs are a technology the first literature that was investigated was that about the Technology Acceptance Model, TAM (Davis, 1989). TAM models how people adopt technology and how successful that technology is. It was developed in the area of Information Systems because the previous models used were not considered reliable. It suggests that the main factors which influence technology acceptance are Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Davis, 1989). At the heart of TAM is measuring belief, as opposed to objective reality. This focus on belief is also central to this research. TAM is a development of the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991). They propose that behavioural intention is a strong determinant of behaviour. Behavioural intention is formed by attitude and subjective norm (Fishbein and Ajzen, 1975).

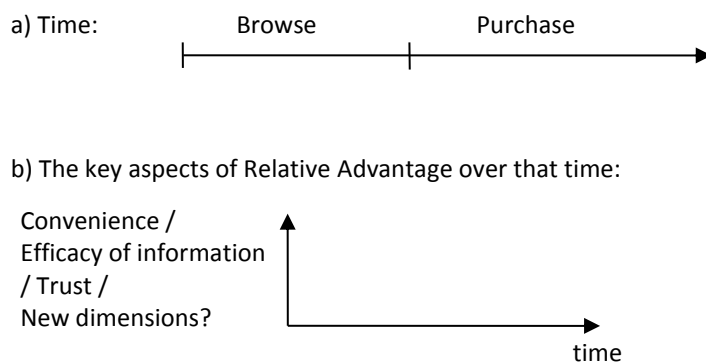
While this was a good starting point it was clear that TAM in its basic form was not sufficient and needed to be adapted for the specific objective of this research. This is a common practise which is evident from the many versions of TAM that exist, for example adapting it for mobile Internet adoption (Kim et al., 2007) or mandatory tasks (Rawstorne et al., 2000). Holsapple and Wu (2007) in a similar way to this research identified the inadequacies of TAM in their attempt to research CVEs. Their focus however was adoption of CVEs in general, for pleasure and they therefore used the Hedonistic theory (Hirschman and Holbrook, 1982) from the area of Consumer Behaviour. This

theory is about the consumption of 'aesthetic products' such as music and films and hence is not compatible with general retail which includes all products. Guo and Barnes (2009a; 2009b) focused on purchasing behaviour of virtual products and also used TRA, TPB and TAM as a basis, adding trust, critical mass, playfulness/enjoyment, social influence and IS quality. Some of the constructs Guo and Barnes (2009a; 2009b) added such as IS quality could not be included because they do not exist in all three channels. Social influence and critical mass, were considered very changeable over time and would not be ideal for identifying advantages based on the essence of a channel and not its evolutionary stage. It was not clear at this exploratory stage if playfulness/enjoyment was a significant factor. It was decided that if the empirical evidence indicated its significance it would be included in a second stage in this research. In agreement with Guo and Barnes (2009a; 2009b), trust was considered necessary to be included. The importance of using trust in addition to TAM for 2D online retail has been identified in the literature, e.g. (Gefen et al., 2003). The need to include trust was therefore clear and straight forward but the way to include it was not so straightforward. Since what was being measured was a CVE that is a channel for retailers the type of trust which was most pertinent was that of institutional trust as defined by McKnight et al. (1998; 2002): Institutional or institution based trust is the sociological dimension of trust in the sense that it is the individual beliefs about an institution, as opposed to a specific vendor. In this thesis it is used to assess the individuals trust in the institutions of offline retail, 2D online retail and retail in CVEs. Choudhury and Karahanna (2008) fulfilled the requirements set since that research attempted to answer a similar question for the channel of 2D website retail.

Choudhury and Karahanna's (2008) research is about the relative advantage of electronic channels. Based on the theory of diffusion of innovation (Rogers, 1995) it assumes that a new channel, as with any innovation, must offer a relative advantage in order for consumers to adopt it. It goes on to suggest that for e-commerce the dimensions of relative advantage are convenience, trust and efficacy of information. It then adds two parameters within which these dimensions exist. The first is time. For this parameter Choudhury and Karahanna (2008) proposed four stages: requirement determination, vendor selection, purchase and after sales service. Their findings however suggested

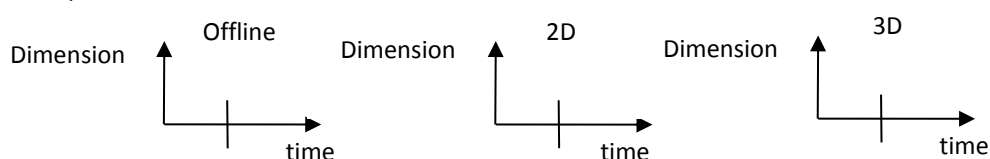
there were only two clear distinctions, information collection and purchase. The other parameter is that of complex and simple products. The suggestion made is that a complex product such as car insurance with its many parameters is in its nature a different purchase than a book which has few parameters beyond the physical product and is highly standardised. This is a valid distinction for 2D website retail and would be very interesting to investigate in CVEs. These dimensions identified in Choudhury and Karahanna (2008) were further developed to cover CVEs as illustrated in diagrams 2.1, 2.2 and 2.3. These diagrams illustrate the dimensions identified in Choudhury and Karahanna (2008) and how they have been further developed to show all the combinations of the dimensions of RA, the two stages and two products.

Diagram 2.3: Illustration of how the stages, dimensions and types of products come together: Dimension of RA over two stages



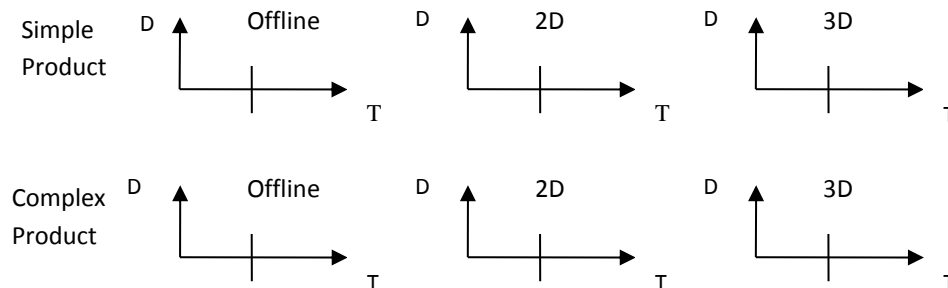
The rationale for these aspects of retail to come together to show multiple dimensions will be presented step by step in three diagrams. The first diagram above shows how the x-axis of our two dimensional Cartesian coordinate system is time. As the empirical evidence in Choudhury and Karahanna (2008) suggested there are two dimensions, browsing and purchasing. On the y-axis there are the dimensions of the RA. In the second diagram the aspects of RA and the two stages are represented for the three retail channels.

Diagram 2.4: The stages, dimensions of RA and types of retail channel come



Lastly the distinction between simple and complex products is added. Therefore the three coordinate systems are duplicated, once for each product type. The resulting six dimensions give a more comprehensive view of retail in a multichannel environment and form the basis of this research.

Diagram 2.5: Adding the two dimensions of simple and complex products



All the aspects of this complex research were compared to other relevant research. A sample of the analysis carried out is presented in table 2.4. The table also includes this research in order to illustrate how it was developed from the previous ones. Those key aspects of Choudhury and Karahanna (2008) form the basis of the issues identified for further investigation. Their research is an ideal basis partly because it draws from many areas. These are primarily diffusion of innovation, trust, the Technology Acceptance Model (TAM) as ‘convenience’ is considered to be similar to the ‘Perceived Usefulness’ parameter and consumer behaviour.

As the brief overview of the literature indicates this research spans a number of areas. These are TAM, trust, CVEs and diffusion of innovation. A careful balance was struck so that these areas were used to support the research without shifting the focus towards any particular one of them to the detriment of the others. This is important because the contribution of this research is not in one of those areas, it is a contribution is to business to consumer e-commerce.

Table 2.4: Choudhury and Karahanna 2008 key features and literature that can be used to extend it

	Title	Key variables	Timeframe	Focus	Value to this research
Choudhury and Karahanna, 2008	The relative advantage of electronic channels: A multidimensional view.	RA = Convenience (PU) + Trust (institutional) + Efficacy of info acquisition. Complex and simple products. Based on Diffusion of Innovation (Relative Advantage of an innovation.)	Hypothesized: Requirement determination, vendor selection, purchase, after-sales service. Proved: Information collection and purchase.	Behavioural intent.	Acknowledges that the best way to assess a new channel, such as VW is to compare it alongside existing channels, such as the 2D Internet. Assesses a channel, not a specific website. Following from this the data collection does not focus on a specific website either.
Pavlou and Fygenson, 2006	Understanding and predicting electronic commerce adoption: An extension of the theory of planned behaviour.	Getting Info: T, PU, PEOU, download delay, time resources, website navigability, information skills. Purchasing: T, PU, PEOU, product value, monetary resources, product diagnosticity, information protection, purchasing skills. Based on TPB (TRA + Perceived Behavioural Control), TAM.	Getting info and purchasing.	Set of variables for TPB.	Includes the product in addition to the information of C & K 2008. (not so straight forward). Uses TAM, Trust and Consumer Behaviour to predict consumer acceptance.
Pavlou 2003	Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the TAM	PU, PEOU, Perceived Risk and Trust. Based on TRA (beliefs, attitudes, intentions), TAM.	Information Retrieval, Information Transfer, Product Purchase. (from Consumer Behaviour)	Intention to transact.	Uses TAM, Trust and Consumer Behaviour to predict consumer acceptance. Good control variables. (reputation, satisfaction, shop. frequency), (past experience, habit, product price, consumer demographics) Includes product value.
This research	The relative advantage of CVEs for retail.	RA = Convenience (PU) + Trust (institutional) + Efficacy of info acquisition. Complex and simple products.	Information collection and purchase.	Behavioural intent	

2.9 Objectives to be explored

Identifying the objectives to be explored before data is collected is useful as it gives focus to the collection and analysis. The objectives enable the researcher to know what facts to gather and distinguish between the relevant and irrelevant. With a topic that is broad keeping that focus is necessary. Furthermore by grounding the objectives in tested theories and models the possibility of having testable relationships between variables that nevertheless may lead to accidental relationships is minimized (Kerlinger and Lee, 2000). Care however must be taken so that the objectives identified do not bias the analysis. This is in line with template analysis (King, 2004). The first two objectives identified are based on the literature. However since this is a new area and there is a gap to be filled there was limited detailed information on those objectives. Therefore in their initial form they were broad and exploratory. As the motivation of this research was to extend Choudhury and Karahanna (2008) to CVEs the third and fourth objectives identified are based on the hypothesis of that research. They have been adapted to exclude some aspects of Choudhury and Karahanna (2008) that focused on validating that theory. Instead they focus on two aspects that the literature review suggests are most pertinent. The fifth objective explores the importance of trust in the RA of channels.

Capturing the value of a retail channel is challenging as there are many parameters. There are also many different implementations and uses within a channel. Various approaches were explored. It is difficult to capture the essence of a channel in its entirety. The only solution would seem to be to focus on some aspects and ignore others. However, by analysing the existing literature and anecdotal evidence two high level categories of the relative advantage of CVEs seem to exist. While the list of parameters within these two categories may not be exhaustive they are a theoretical framework which can be added to if necessary by empirical research such as this one. The two categories are the RA of CVEs for retail that come from characteristics it draws from the 2D websites and the RA of CVEs that come from characteristics it draws from the 'bricks and mortar' environment. We posit that these two

aspects capture the essence of CVEs. The first and second issues identified for further investigation that follow on from this are:

Objective 1: A relative advantage of CVEs to the 2D Internet for e-commerce, may be the aspects of offline retail that it includes that do not exist in the 2D websites.

Objective 2: A relative advantage of CVEs for retail compared to offline retail may be aspects of 2D e-commerce that it includes that are not included in the offline retail environment.

Choudhury and Karahanna (2008) suggested that a consumer would adopt a new channel only if it was perceived to offer an advantage to existing channels. This argument is built on the theory of diffusion of innovation (Rogers, 1995). Furthermore it was suggested that such a decision would have multiple dimensions, those being convenience, efficacy of information and trust. These dimensions' importance may vary along the stages of the purchase process and whether a product is simple or complex. While all of that theory is used as the basis for this work the two most pertinent relationships of variables were chosen. Those were then extended to CVEs. The third objective states that the 'variable' dimension of RA will vary across the 'variable' of stages of the purchasing process:

Objective 3: Consumers may vary their intended usage of CVEs across the different stages of the purchase process because the significance of the dimensions may vary across those stages.

The nature of gathering information and making a purchase for a complex product in comparison to a simple product is different. Therefore, the nature of how the technology and the other aspects of a channel are used is different. For example, for a complex product such as car insurance a richer medium, such as a CVE may be beneficial. Furthermore for a simple product such as a book the practicality of the 2D websites may outweigh the benefits of the richer virtual world. These two examples seem to be valid based on anecdotal evidence. They have not been validated empirically to a satisfactory degree. A more nuanced understanding of this would help organizations plan their

multichannel presence. Therefore the variables to compare are consumer usage, product complexity and purchase stages:

Objective 4: Consumers' usage of CVEs may be different for simple and complex products.

Based on the literature review institutional trust, as it has been defined and modelled by McKnight, et al. (1998; 2002) has been identified as the relevant aspect of trust. This is in agreement with Choudhury and Karahanna (2008). When considering institutional trust for CVEs it is important to clarify what the institution being considered is. For the purpose of this study the institution is SL, as opposed to CVEs in general. This is because it would be extremely difficult to collect data from all the CVEs and it would be of limited value because of their varying natures. Therefore the institution of the Internet, as it was defined by McKnight et al. (2002), is being compared to the institution of SL. Because of the more controlled environment which exists in SL and the centralised authority an issue to be further investigated was whether:

Objective 5: CVEs such as SL may have the RA of a higher degree of institutional trust compared to the 2D websites.

CHAPTER THREE – RESEARCH METHODS

3.1 Introduction

This section will discuss the methodology chosen and the reasons for this choice. There were many challenges most of which came from the broad nature of this research. This breadth was chosen because this research was intended to contribute directly to practice, as well as theory and the growth of knowledge. Furthermore assessing three channels and the differences in advantages between them involves many issues in each of them. This topic could be approached from a psychological, retail, marketing or human-computer-interaction perspective. Carefully choosing the most suitable methodology was therefore challenging. The goal was to achieve the objectives set out in a scientifically rigorous way. Decisions had to be made on the many stages of the process and the many levels of abstraction. This is documented in this chapter one by one. The first level of abstraction is the philosophical perspective that is the foundation for the next stage that is the nature of the methods chosen. After those are established the stages of data collection and the analysis used to achieve the objectives are covered. Finally the whole research framework is illustrated.

3.2 Philosophical perspectives in research

3.2.1 Introduction

The discussion of the methodology will start with the philosophical perspective and articulate the epistemological position taken as this influences all the other decisions such as how data will be collected, analysed and interpreted. Epistemology is the term used for the philosophical theories, perspectives or assumptions that attempt to comprehensively, or partially, cover the issues related to scientific research. It is defined as the assumptions about knowledge and how to obtain it

(Hirschheim, 1992). Before identifying the epistemological perspective of this research there will be an overview of the main theories highlighting their key features and discussing the relevance to the present research.

3.2.2 Positivism

The first philosophical perspective to be discussed is positivism the roots of which can be found as far back as ancient Greece. The term, however, was first proposed by August Comte, in 1830 (Comte, 1830). Comte considered both natural and social science and emphasized the value of having empirical goals and using empirical data, discovering laws and using scientific methods. From Comte's time until today positivism has been defined in many different ways. Broad definitions consider it to be the application of scientific method to research (Durkheim, 1895) while more rigid and specific definitions focus on an empirical reality (Ayer, 1936). One useful definition is that positivist epistemologies attempt to find regularities and causal relationships (Burrell and Morgan, 1979). This definition identifies two central characteristics of positivism: Firstly considering that there are regularities in the world suggest that with the right sample and analysis some broader conclusions that apply to a population beyond the sample, can be drawn. Secondly considering that there are causal relationships suggests that models can be developed that explain what is being explored.

Despite some limitations the positivist principle of using scientific methods to identify laws is widely used in social science in the form of quantitative statistical analysis and hypothesis testing. This paradigm allows for many of the scientific methods used in natural science to be used in social sciences such as experiments, surveys and statistics (Neuman, 2006). Thus principles of hypothesis testing, sampling and statistical inference can be applied to quantitative research in social sciences enabling statistically derived conclusions to be drawn that can be reproduced and tested. This ability to test and attempt to falsify and disprove a result as suggested by Karl Popper (1935) is an advantage that makes quantitative analysis with elements of positivism appealing.

This draws on the concept of the deductive approach, based on deductive reasoning, which is part of the scientific method used in social sciences. This concept is based on Popper and positivism. In its simplest form this requires a theory to be put forward and then tested. In practise this often follows four stages: (1) Theory, (2) Hypothesis, (3) Data and finally (4) Conclusions. Another more detailed explanation is (1) verifying an internally sound premise, (2) distinguishing between logic and testable theory, (3) comparing with existing theory and (4) empirically testing and attempting to falsify.

The weaknesses, or limitations, of positivism in social sciences to a large extent come from the very fundamental point that social sciences are not the same as natural sciences. While critics of positivism such as Max Weber (Secher, 1962) acknowledge the need for a scientific approach they point out that the social world is not as independent from previous history, independent of context or generalizable as the natural world (Ahsley and Orenstein, 2005). These criticisms are valid and need to be considered in order to mitigate them in many aspects of the data collection and analysis. For example, how can the bias of the observer be understood and taken into account; are certain members of a focus group being influenced by others?

The strengths and weaknesses of positivism are dependent, to an extent, on what definition is being used. The purist version of positivism is now unpopular in most social research with the exception of economics. Most contemporary proponents of positivism acknowledge its weaknesses and limitations. In this way the strengths can be built on and the weaknesses mitigated. Scientists that value the positivist approach but acknowledge some, or all, of its limitations are considered post positivists.

3.2.3 Constructivism

Constructivism can be considered as being on the opposite side of the spectrum from positivism. The reason why it is the opposite and not just different is because it refutes positivism's fundamental principle, that there is an objective reality separate from the observer that can be measured. Instead the constructivist viewpoint is that people, including scientists, construct their reality using

convention, human perception and social experience. This does not mean necessarily that laws cannot be created or findings cannot be generalized but that these are based on, and only speak for, people's perceptions.

There are many criticisms of constructivism. The main one is that it invariably leads to everything being relative since truth is not absolute but constructed and can hence be constructed in different ways. The research presented in this thesis was sensitive to the role of perception and experience and took them into consideration in, for example, the way the survey questions were constructed. However, due to this major criticism a constructivist view was not taken. The position of this thesis is, therefore, somewhere between the two extremes of positivism and constructivism as both have the weaknesses that have been discussed.

3.2.4 Interpretivism

This approach assumes that our perception of reality is socially constructed by shared meaning, language and consciousness. The person participates in the reality and science can only use the person's interpretation of it. Thus, like constructivism, it considers society to be subjective and rejects the positivist principle of an objective reality and the validity of assumptions from natural science. Instead it proposes that actions are based on three principles: Consciousness, action and unpredictability.

Its alleged advantage is the alleged weakness of positivism, the concern with the context. While positivism seems to ignore it, interpretivism seems to focus on it. Despite its rejection of objective reality, interpretivism accepts that facts exist but considers them to be dependent on the specific context. Because of this strict pairing of fact to contexts this assumption is usually used with qualitative research where a series of quotes can capture a series of distinct contexts. Qualitative research is usually inductive following three stages: (1) Data, (2) Tentative conclusions and finally (3) Theory. These opposing strengths, of constructivism and positivism, suggest that these seemingly

opposing theories can in some circumstance be complementary. This is partly why these two epistemological theories are the most popular in information systems and e-business research.

3.2.5 Critical Realism

The Critical Realist viewpoint lies between positivism and constructivism and can be considered to be a post-positivist development of positivism since it shares similar principles. Critical Realism acknowledges a role for natural science assumptions but also appreciates that those assumptions cannot fully explain the social world. Cook and Campbell (1979) consider that positivism can never fully model the social world using causal relationships because such a feat is beyond humanity's sensory and intellectual ability.

The way Critical Realism attempts to mitigate the weaknesses of positivism is by using multiple methods and triangulating. If the results from multiple methods agree the confidence in the results vastly improves. This is compatible with Poppers falsification principle (Popper, 1935). In terms of research process, it takes the deductive process and adds an inductive process.

3.2.6 Conclusion

Although there are other epistemological approaches such as functionalism and intentionalism this review covers the three main approaches, positivism, interpretivism and critical realism, as these are most popular in information systems and e-business. The fourth approach, constructivism was included to illustrate the spectrum of theories and, together with positivism, frame the discussion. The three principle theories have merits but this thesis takes the epistemological position of critical realism because it follows the principle that there is an objective reality in social science as in natural science, it can use deductive quantitative methods that enable causal generalizable knowledge and it allows for inductive qualitative research that can capture large numbers of specific contexts and enables new issues to emerge from the data. Finally, triangulation strengthens the validity of the results. Beyond

the advantages of critical realism some hold the view that a researcher must not be dogmatic and choose the methodology that suits the specific research problem at hand (Ghauri and Gronhaug, 2005). The selection of research methods will be discussed in the following sections.

3.3 Research methodology in e-commerce

3.3.1 Introduction

This section will discuss specific research methods used in e-commerce B2C research building on the epistemological position put forward in the previous section. The methods discussed are quantitative, qualitative and mixed. The last section analyses the methods used in studies with similar objectives.

3.3.2 Qualitative methods

The popularity and appreciation of qualitative methods has surged since the 1980s (Tashakori and Teddlie, 2002) to end the dominance of quantitative methods in what is considered the second methodological movement. While there is inevitably still discussion about the strengths and weaknesses of qualitative methods, their value is broadly accepted and the ‘paradigm wars’ of the 70s and 80s (Gage, 1989) have mostly ended as the discussion has moved on. There is still more controversy and ambiguity concerning qualitative methods than quantitative methods (Denzin and Lincoln, 2003) but this is inherent in their nature. This controversy and ambiguity even exists in the definition, with many competing interpretations. The definition used in this thesis is: ‘Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings and memos to the self.’ (Denzin and Lincoln, 2003, p. 5).

This definition captures two key characteristics. Firstly the observer is active in the world being researched and, therefore, the level of objectivity of quantitative methods is not achievable. Secondly

the researcher uses interviews, photographs and other forms of data that do not, at least initially, involve measurement and numbers.

The strength of qualitative methods lie in capturing what quantitative research is not strong at capturing. This is often referred to as why something social happened and the meaning as opposed to the causal effect (Denzin and Lincoln, 2003). Furthermore, its proponents argue that the lower level of, or lack of, abstraction from specific contexts makes it more effective at capturing the individuals point of view, the constraints of life and thus achieves richer descriptions (Denzin and Lincoln, 2003). Its weaknesses are its inability to achieve what quantitative methods achieve. This will be discussed in the next section.

3.3.3 Quantitative methods

Quantitative methods were originally applied in natural sciences but are now broadly accepted as a valid and useful form of research in social science. Many of the critics of this approach do not reject post-positivist quantitative methods entirely, but argue that they only capture one aspect of reality (Denzin and Lincoln, 2003). Quantitative methods use sampling techniques expressed numerically that can be manipulated mathematically enabling the researcher to estimate future events or quantities. The first advantage of quantitative methods is its roots in natural sciences that ensure that the methods used are proven to work, at least in that context. The second advantage is the insight offered to the researcher with the ability to test hypotheses and to generalize findings beyond the participants and the time frame of the data being collected.

The focus on theory verification is achieved with the use of confirmatory statistics, using inference in order to test a hypothesis, the causal relationships of a model or a theory. The two paradigms of statistical inference are the frequentist and Bayesian. Frequentist inference attempt to arrive at a conclusion in relation to a sample of data based on the frequency and proportion of the data. Bayesian probability can assesses whether proposition is true or false and it is popular with hypothesis testing.

For business and research, beyond this verification by statistical inference descriptive statistics are also widely used either on their own or in combination with inferential statistics. The main types of descriptive statistics are distribution, central tendency and dispersion.

3.3.4 Mixed methods

The term mixed methods is usually used to describe methodologies that incorporate the two worldviews of qualitative and quantitative methods (Tashakori and Teddlie, 2002). This is the definition of the term used in this thesis. Using multiple methods of data collection within one of those two worldviews, for example focus groups and interviews, is usually referred to as multi-method (Cambell and Fiske, 1959) and is not the definition of mixed methods followed in this thesis.

Mixed methods is considered the third methodological movement in social and behavioural science (Tashakori and Teddlie, 2002) as it came after the first movement, quantitative with the related philosophical perspective of positivism and post-positivism, and the second movement of qualitative methods with the related philosophical perspective of constructivism. Mixed methods can be considered to be close to the philosophical perspective of critical realism as both highlight the value of combining the deductive approach associated with quantitative research, the inductive approach associated with qualitative research and triangulating the results. Therefore for the same reasons that critical realism was selected as the epistemological perspective mixed methods was selected as the methodological approach.

3.3.5 Methods used in B2C e-commerce research

While the methodology was determined by assessing the merits of the established methods it was useful to confirm whether the most relevant research identified used similar means to similar ends. Table 3.1 presents some useful research methods from the areas discussed in the literature review, chapter 2, focusing on multichannel retail, CVEs, TAM and trust. The research included in the table

was selected either because it was typical of research in that area or because it was especially relevant to this thesis. The diffusion of innovation framework is not the focus of any of them but it is incorporated by some of them (Choudhury and Karahanna, 2008) in a similar way to its use in this thesis.

There are two key insights to be gained from this table. The first insight is that qualitative research in those studies is always used as inductive and exploratory. It is used to develop an understanding or theory. While the theory of qualitative methods does not confine them to this role, these studies are usually used as a first step to explore, clarify and develop theory and hypotheses. The second insight to be drawn from the table, in complete agreement with the theory, is that quantitative methods are used as deductive, confirmatory and to test a hypothesis, model or theory. With these two points in mind, it is not a surprise that the studies that attempt to explore, develop hypotheses and then test them use both, and hence mixed methods. The popularity of quantitative methods is to be expected with such a broad topic like multichannel retail but the limited use of mixed methods is misleading as research that applies them often reports their research in two studies splitting the qualitative and quantitative sections.

Table 3.1: Research methods used in B2C e-commerce research

Study	Title	Area	Method	Inductive / deductive
Choudhury and Karahanna, 2008	The Relative Advantage of electronic channels: A multidimensional view.	e-commerce (B2C), multichannel retail.	Quantitative (survey)	Deductive (confirmatory, model validation)
Noble et al., 2005	Consumer derived utilitarian and channel utilization in a multi-channel retail context.	e-commerce (B2C), multichannel retail.	Quantitative (online survey, closed questions)	Deductive (confirmatory, hypothesis test)
Goel and Prokopec, 2009	If you build it will they come?—An empirical investigation of consumer perceptions and strategy in virtual worlds.	e-commerce (B2C), CVEs	Qualitative (interviews in CVE), quantitative (survey, closed questions)	Both (exploratory, hypothesis test)
Gefen et al., 2003	Trust and TAM in online shopping: An integrated model.	e-commerce (B2C), trust and TAM	Quantitative (online survey, closed end questions)	Deductive (confirmatory, hypothesis test)
Pavlou et al., 2007	Understanding and mitigating uncertainty in online exchange relationships: A principal agent perspective.	e-commerce (B2C), technology adoption	Quantitative (online survey, closed end questions)	Deductive (confirmatory, hypothesis test)
Pavlou and Fygenson, 2006	Understanding and predicting electronic commerce adoption: An extension of the theory of planned behaviour.	e-commerce (B2C), Technology adoption	Quantitative (online survey, closed questions)	Deductive (confirmatory, hypothesis test)
McKnight et al., 2002	Developing and validating trust measures for e-commerce: An integrative model typology.	e-commerce (B2C), trust	Quantitative (closed end question questionnaire in experiment)	Deductive (confirmatory, model validation)
Kumar and Venkatesan, 2005	Who are the multichannel shoppers and how do they perform?	e-commerce (B2C), multichannel retail	Quantitative (sales records analysis)	Deductive (confirmatory, model validation)
Schoenbachler and Gordon, 2002	Multichannel shopping: Understanding what drives channel choice.	e-commerce (B2C), multichannel retail	Qualitative (analysis of CVEs, no participants)	Inductive (exploratory, theory development)
Lehdonvirta, 2009	Virtual item sales as a revenue model: Identifying attributes that drive purchase decisions.	e-commerce (B2C), CVEs	Qualitative (analyse CVEs, no participants)	Inductive (exploratory, model development)
Cagnina and Poian, 2009	Beyond e-business models: The road to Virtual Worlds.	e-commerce (B2C), CVEs	Qualitative, quantitative (analysis of CVEs, no participants)	Both (exploratory, hypothesis development and test)
Berthon, 2010	Advocating avatars: The salesperson in Second Life.	e-commerce (B2C), CVEs	Qualitative (analyse CVEs, ethnographic participant observation, no participants)	Inductive (exploratory, model development)

3.3.6 Research Approach and Methodology chosen

This section discussed the qualitative, quantitative and mixed methods using the theory on these methods and their use in similar research. The conclusion is that mixed-methods build on the epistemological position of critical realism utilising the strengths of qualitative and quantitative methods and mitigating their weaknesses by triangulation. The ideal way to apply mixed methods to this research is to start with broad, exploratory, inductive, qualitative methods to develop hypotheses or objectives and then use deductive, quantitative methods to assess and test them. Importantly the end product is not just the proven, or disproven hypotheses but also all the insight gained from the ‘soft’ data.

3.4 Research design

3.4.1 Introduction

Using the conclusions of the previous section the research design goes down a level of abstraction to the specific methods used. The exploratory, inductive, qualitative methods started firstly with focus groups. In the second stage the focus was narrowed and deepened with interviews. This provided the basis for findings that were tested by a deductive, quantitative, close-ended survey.

3.4.2 Data collection

3.4.2.1 Focus group method

The pre-test of the focus group stage involved 14 students in four groups. After that, five focus groups with a total of 26 participants were carried out. Five or six participants were in each group. There was a similar number of males and females in each group and the same number over all. The participants in the pre-test were undergraduates from the University of Manchester. The participants in the focus

groups were postgraduate students across a range of courses from the same university. Students are often used in e-commerce research (Gefen and Straub, 2003; Pavlou and Chellappa, 2001). They were recruited through the university's weekly email to students requesting participants for research. All respondents received a small incentive for participation¹. The use of undergraduate students is discouraged in business research but postgraduates are considered to be a better sample, with some limitations however in terms whether the results can be generalised (Bello et al., 2009). Some participants did not have experience in purchasing in CVEs so a short demonstration of the process was shown at the start. As the primary goal of the focus groups was to identify issues to explore further in the interviews and no generalization would be made based on the focus groups themselves this sample was considered adequate. Further focus groups were not carried out as the same issues kept appearing after the second focus group. The focus groups were held on campus and took between 45 to 60 minutes. They were voice recorded and then transcribed.

3.4.2.2 Interview method

The second stage comprised individual in-depth interviews in SL. Recruitment was carried out through an 'inworld' agency called Reperes. This is a French organization involved in data collection for academic researchers and market research for practitioners. They have been active since 1980 and they were the first Market Research institute in SL. Reperes (2010) ensured that participants had full SL membership and were active users and purchasers in SL for at least twelve months². As the participants had extensive exposure to the issues being explored they could illustrate their beliefs with examples. The venue was the office of Reperes in SL. There were twelve participants, six female and six male, between 23 to 54 years of age and they came from various parts of the UK. Nine had a university education and the other three had graduated from high school. The data were captured through the computer text messaging facility within SL. As it was a semi-structured interview, there were just nine main questions with some additional probes available if needed. Care was taken to keep

¹ Participants were paid 10 pounds to participate.

² Reperes were paid 550 pounds for their services in recruiting participants.

a balance between allowing the participant to say whatever they had on their mind and getting their comments on specific issues. In order to achieve this, the questions started very broadly and got successively more specific. This approach also minimizes the extent to which the information contained in the questions adds to the knowledge of the participants and influences their beliefs. A rich response and saturation were met after the ninth interview and the same issues kept appearing so once twelve were completed no more were implemented. Twelve interviews are often sufficient to reach theme saturation (Guest et al., 2006; Small, 2009). Had it been considered necessary for more interviews to cover the themes of this research they would have been conducted.

3.4.2.3 Survey method

The online self-completion sample survey was pretested with 42 participants of varying backgrounds including undergraduates, postgraduate master students, PhD candidates, academics and participants from outside the university, both sexes, ages ranging from 19 to 64 and varying levels of experience. The pre-test was used to establish the clarity of the survey and the reliability of the Qualtrics online survey technology disseminating it (Qualtrics, 2010).

The target for the sample survey was a minimum of 650 participants so that the statistical analysis could assess the issues to a high level of accuracy. The reasoning behind the sample size was that a sample of 600 would meet or exceeds most requirements posited to achieve a maximum margin of error of 5% and confidence level of 95% for a large population (Barnett, 2003). The extra 50 participants were a safety buffer for responses that would have to be excluded for some reason. Beyond that the sample composition had to conform to certain pre-requisites. It was decided to have the same requirements from the participants as the interviews: A minimum of twelve months experience in SL, they must be active users of SL, and they should have experience of a purchase in SL. In order to achieve these requirements the survey was administrated by the research firm Reperes to carefully vetted participants. The technology used was the Qualtrics online survey software (Qualtrics, 2010), hosted on the University of Manchester, Manchester Business School servers. This

software provides the online survey and stores the responses that can then be extracted to analyse with other software. Reperes had compiled a list of potential participants that they had contacted in SL. The participants expressed an interest in taking part in research projects. Reperes contacted the prospective participants on their records via 'in world' SL message that included a link to the online survey³. There were 616 completed responses.

3.4.3 Data analysis

3.4.3.1 Qualitative analysis - Template analysis

Template analysis (Denzin and Lincoln, 2003) is the process of arranging and analysing textual data into themes. In essence it is a structured approach to summarising and ordering qualitative data. The themes can originate outside the data, possibly having been decided before the data collection started, as in the present case, or they can be drawn from the data during the analysis. The themes could represent beliefs or actions. The benefits of template analysis are firstly to reduce the data to that which is necessary, secondly it could be used to compare between different types of participants, thirdly to provide insight into the meaning of what is being analysed and lastly to infer relationships between themes.

For this research Nvivo 8 (QSR, 2010) was used to implement the template analysis. The five issues identified in the literature for further exploration formed the initial five themes. Data relevant to them were grouped into nodes. Other themes emerged from the data and other nodes and interrelationships were formed. The five issues had a number of child nodes that were relevant to them in some way. The number of relevant comments for each node were calculated.

³ Reperes were paid £1000 for their services.

3.4.3.2 Quantitative analysis

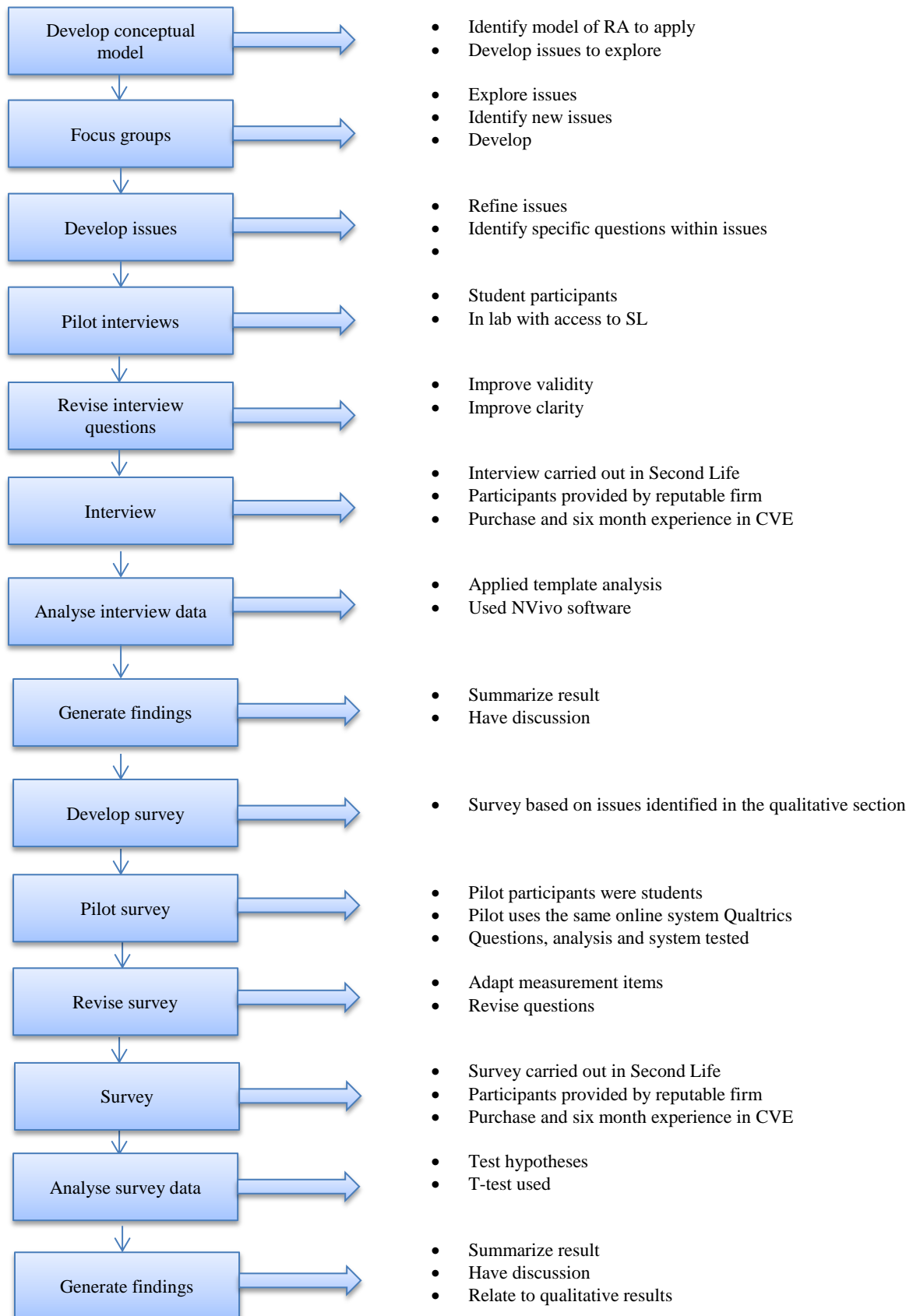
The quantitative analyses were applied to the survey data. The survey questions arose from the qualitative data collection and analysis. Some were directly related to the five objectives and some were not as they emerged from the qualitative data and had not been expected. Each question added to our understanding directly and was an end in itself. Therefore each question was analysed and discussed individually. Those that were related to the five objectives served to assess them. The questions were posited as vignettes to which the participants chose from a scale the degree to which they agreed or not. By identifying the mean and standard of deviation of the responses the degree to which that statement represents that of the population the sample came from could be assessed. More powerful quantitative methods were also used to assess the objectives.

The choice of quantitative statistical methods was based on the objectives and the type of data. For the main objectives, hypothesis testing was needed which ruled out all the analysis methods not suited for that. Since the data was neither nominal, nor ordinal methods such as Chi-square, K-S, Runs, Binomial, Mann-Whitney, Median, Sign, Wilcoxon and McNemar were ruled out (Malhotra, 1999). As the data were interval or better the options were the t-test and z-test. Since there were paired samples the z-test was rejected leaving the t-test (Malhotra, 1999). The t-test involves comparing the means of two groups in order to assess whether they are sufficiently different that they can be considered to be from different populations (Black, 1999). For the descriptive analysis additional methods such as ANOVA and cluster analysis were used to develop a better understanding of the data. ANOVA is the analysis of variance between multiple means (Black, 1999). Cluster analysis is a collection of statistical methods used to identify groups within the data based on features that are similar to each other and dissimilar to other groups (Nurusis, 2010). The combination of targeted and broader analysis was also implemented in the qualitative analysis.

3.4.4 Research framework

This research intends to be both exploratory and extend previous work, (Choudhury and Karahanna, 2008), consequently, a balance was struck between a structured approach and being open to new issues introduced by the participants. This was achieved by starting the data collection with less structured methods and progressing through to more structured methods. The process is illustrated in diagram 3.1. The first stage of data collection was the focus groups that encouraged shared and individual ideas and also encouraged participants to reflect on their experiences as they listened to those of others. The results of these sessions informed questions for the second stage of semi-structured individual interviews. Such individual depth interviews capture the individual's response without the influence of other participants. Topics for discussion included the specific issues identified above and in the focus groups. The sources of the questions were varied because great care was taken for the questions and subsequent data collected to be as comprehensive as possible. The findings developed encompassed the key issues identified in the qualitative stages and were then tested using the survey data.

Diagram 3.1: Research framework



3.5 Conclusion

This research attempted to be exploratory, broad and allow new issues to emerge. Some boundaries and a degree of focus were necessary and the methodology was developed to achieve the right balance. This was important as the goal was to capture the consumers' beliefs on multichannel retail not one channel or one aspect of one channel. The many stages of the research methodology chosen brought a high level of complexity, increased the level of difficulty and increased the amount of time required for them to be completed. Their purpose, however, was to gain the most insight possible with a high level of rigour. Qualitative methods have been described as 'quilt making' (Denzin and Lincoln, 2003), and these multiple methods were an attempt to make the whole quilt, and not just a part of it.

CHAPTER FOUR - QUALITATIVE RESEARCH

4.1 Introduction

This chapter uses empirical evidence collected using the qualitative methods of focus groups and interviews to explore and refine our understanding of the objectives identified and enable new issues to arise. The topic being explored is multichannel retail. Within a channel the influences on the consumers are many, from functional to aesthetic. A functional aspect of the experience may influence everyone in the same way, for example the time it takes for a website to load, and an aesthetic aspect could influence everyone differently for example a colour palette that is perceived to be boring. In the end, as every shopping assistant knows, the customer is always right.

One popular taxonomy categorises qualitative methods in terms of the level of analysis. There are three resulting categories, individual, such as diaries and life stories, group, such as focus groups and organizational, such as ethnography and case studies (Golden- Biddle et al., 2002). Business to consumer e-commerce does not usually focus on organizations and this is not the focus of this research either. Therefore, the methods related to organizations are not used. The other two levels are implemented.

The next section gives a detailed account of the process of data collection and analysis that was carried out in the focus groups and interviews. The high level of detail is necessary so that the methods could be replicated if necessary. The third section offers the findings, firstly of the focus groups and then of the interviews. The findings are discussed initially in relation to the five objectives identified and then in relation to all other issues that were noteworthy. Finally the conclusion gives an overview of the findings and their significance.

4.2 Data collection

4.2.1 Focus group data collection

Before the focus groups were carried out some trial focus groups were conducted. The purpose of these was to improve the substance and the process. In terms of substance despite the extensive literature review on the topic it was useful to get initial feedback on the specific objectives in question for this research. It was the first of many steps in refining the focus of the research and the contribution. In terms of process the researcher had never carried out a focus group so there was a need to get experience on all its aspects. These focus groups were carried out in a large office in the Manchester Business School, East Building. The participants were undergraduates that the researchers' supervisor taught. They were compensated with three pounds for the thirty to forty minutes duration. There were five groups of three to four participants. Improvements were made, some were significant such as the number of issues discussed and the venue while some were more nuanced such as how to treat the participants. The original focus group schedule was developed based on the literature. This was refined in the trial focus groups. The refinement subsequently continued in the interviews and survey.

After the trial five focus groups were carried out with a total of twenty six participants. Five or six participants were in each group and there was an even number of males and females. The participants were postgraduate students from the University of Manchester across a range of courses. They were recruited through the university's weekly email to students requesting participants for research. A financial incentive of ten pounds was given. Some participants did not have experience in purchasing in CVEs so a short demo of the process was shown at the start. The focus groups were held on campus and took between forty five to sixty minutes. They were voice recorded.

The questions asked were based on the objectives identified in the literature review. The full list of questions used by the researcher can be found in appendix A. In cases where the objectives identified were also present in the research this thesis builds on (Choudhury and Karahanna, 2008) the same terminology was used. As this thesis attempted to extend that research (Choudhury and Karahanna, 2008) using the same terminology from the start would be beneficial. Beyond the questions put to the group for discussion there were some prompts and a timekeeping plan included in appendix B. The prompts unlike the questions were optional and were to be used by the researcher if the discussion was too short or did not cover some aspects of a question that could be useful. The timekeeping plan involved allocating an approximate time to be spent on each question. The intention of the questions, prompts and timekeeping plan were not to have overbearing control over the discussion but to ensure that all the issues were covered in the time allocated. This was a responsibility towards the participants so that no more of their time was taken beyond what was necessary.

The principle used in the methodology of this thesis to start broadly and narrow down progressively also applied to the focus group questions. The first question was very general serving a secondary role of being an ice breaker. It was expected that every participant would have something to say. The first question asked what the participants experiences were in SL. The second question asked what their opinion of SL was in general. Throughout the focus group both beliefs and experiences were sought out. Some questions like the first focused on experiences and some like the second focused on beliefs. The third question asked what their experiences were in making purchases in SL. This question had five sub sections comparing the three channels, assessing criteria, information, convenience and trust. The fourth question had six sub questions. The issues covered were RA, the stages in the purchasing process, simple and complex products, and the purchasing experience. In the final section the researcher attempted to summarise what was said and offer the opportunity to the participants to add something that was not already covered.

The limitations of this data collection were partly inherent in the method and partly due to the way it was implemented. The limitations of qualitative methods have been discussed in the previous chapter so this section will therefore point out those most relevant to this section. Often these limitations are the other side of the same coin as an advantage and cannot, therefore, be taken out of the equation. Firstly the researcher has an active role in the data collection. The researcher explains the purpose of the focus group, introduces each topic of discussion and answers any questions. The researcher attempted to strike a good balance between accomplishing these tasks proficiently and limiting the influence on the discussion. A second limitation that can compound the first is that the responses can be considered to be subjective and based on impressions and feelings (Bellenger et al., 1976). The limitations are mitigated by implementing the method as correctly as possible and by drawing conclusions that stay within the boundaries that these limitations set.

4.2.2 Interviews data collection

In depth semi-structured interviews in SL formed the second stage of the data. The recruitment was carried out through an ‘in world’ agency, Reperes (Reperes, 2010) in order to ensure that participants had full SL membership, and were active users and purchasers in SL for at least twelve months. This would ensure that the respondents had the relevant experiences to develop opinions on issues. Those experiences would be beneficial in an additional way as they would be used to illustrate those opinions with examples. Detailed examples would make the analysis more effective in understanding and representing those opinions. Beyond the recruiting the interviews were also carried out in SL at Reperes ‘in-world’ offices. This would act as an additional safeguard ensuring that the participants had the relevant experience. Their behaviour, level of skill and avatars appearance would be an indication of their experience.

There were twelve participants, six female and six male, between 23 to 54 years of age and from various parts of the UK. Nine had a university education and the other three had graduated from high school. Their elaborate clothes and avatars and more importantly their extensive knowledge were strong indications that they had the length and depth of experience Reperes claimed. Overall the participants were very knowledgeable, enthusiastic, polite and easy to work with. The participants were asked to answer the questions as themselves not an online persona or fictional character.

The interview was semi-structured with nine main questions and some additional probes available if needed. Care was taken to keep a balance between allowing the participant to say whatever they had on their mind and getting their beliefs on specific issues. In order to achieve this, the questions as with the focus group, started very broadly and got successively more specific. This approach also minimizes the extent to which the information contained in the questions adds to the knowledge of the participants and influences their beliefs. The full interview questions, prompts and timekeeping plan are provided in appendix B. Beyond the prepared prompts the researcher would follow up on anything the participant mentioned that had the potential to be expanded on. For example in the first interview, in response to the first question the participant mentioned personal development. Once the participant completed their response the researcher asked them a follow up question on that.

The first question asked the interviewee about their experiences and thoughts on SL in general. The second question covered purchasing goods in SL. The next three questions compared the three retail channels in terms of information, convenience and trust. The next question asked what the RA was of each channel. The last three questions asked about the purchasing stages, simple and complex products and the richness of experience.

The interview in SL was conducted using the messaging functionality. The participants were in close proximity and there was visual contact throughout the interview. This messaging method of communication was chosen over voice for three reasons: Firstly there was a risk that a participant would not have a microphone to enable them to use the voice. Secondly it would increase the risk of something going wrong either in the communication or capturing the voice. Lastly it would require the interviews to be transcribed. The participant would arrive outside the office where they were greeted by the researcher and escorted inside. The researcher's and participant's avatar would then sit on a couch and start the interview. The pictures in figure 4.1 illustrate the environment where the interviews took place.



Figure 4.1: Screenshots of the interviews in SL

With a sample of twelve participants one limitation was the representativeness of the sample. The participants were active SL users and hence possibly biased favourably toward it compared to someone that choose not to use SL. It is also more likely that they were more technology savvy for the same reason. If we were to put them on the technology adoption life cycle (Bohlen and Beal, 1957), they would probably be ‘innovators’ or ‘early adopters’ and would hence have different characteristics to ‘laggards’. A less common potential limitation comes from the use of avatars. It is possible that this would make it easier for participants to be dishonest or get influenced by the ‘personality’ of their avatar which might be different to their own.

4.3 Qualitative data analysis

The purpose of the analysis was to understand the meaning of what the participants had said. The limitations discussed in the data collection section formed the boundaries to which the conclusions could reach. For the focus groups the voice recorded data was transcribed by the researcher. The transcribed data of the focus groups and interviews were entered separately into Nvivo 8 and the analysis was implemented using template analysis (King, 2004). The template analysis method allows verification and, crucially, extension of previous research which is one of the aims of this research (Miles and Huberman, 1994). This method of analysis is compatible with the realist approach taken (Miles and Huberman, 1994).

Template analysis involves creating a list of templates that represent themes. Themes can be defined before the data collection, can be modified during the analysis or emerge from the analysis. In this thesis the research it develops (Choudhury and Karahanna, 2008) provided the template foundation with some additions based on the broader literature review. The templates were the five objectives identified in chapter two.

Any opinion expressed by a participant that was relevant to those five objectives was categorised into the equivalent five nodes. Beyond those five objectives any point that was considered to be useful or interesting in some way was also tagged and a node was created. For some objectives there were a number of issues within them so child nodes were created. All these nodes were created and populated within Nvivo. While this was qualitative research and the analysis was based on the usefulness of the information the nodes that had many references were considered to warrant particular attention. This did not mean that opinions expressed by participants that would seem to be useful but were not popular were not considered further and reported in the findings. The level of support for each opinion was shown in the findings. The reason why an opinion was included was explained and its popularity was then indicated. This could be described as quantifying qualitative data (Denzin and Lincoln, 2003).

There is an element of subjectivity in this process as it is the researcher that decides what is relevant. This was mitigated by tagging anything that had any potential of being useful, considering whether it was indeed useful and considering the popularity of that view. As stated in the introduction ‘the customer is always right’ and the researcher did not question the rationale or merit of the participants’ opinions, only their relevance. Evidence of this is the many opposing opinions on the same topic reported in the findings. Overall the researcher attempted to understand the meaning and emergent themes, was sensitive to every aspect of the process and attempted to achieve a holistic view as these are characteristics of effective qualitative research (Cassell and Symon, 2004).

4.4 Qualitative research findings

4.4.1 Introduction

The qualitative data analysis findings are presented first for the focus groups and then for the interviews. They are divided into the five objectives chosen before the data was collected and emergent issues. The interview findings are the culmination of the qualitative analysis and are thus given in greater detail.

4.4.2 Focus groups

There were areas of unanimous agreement and areas of no agreement where every participant had a different opinion. There were issues that caused heated debates and issues that left participants indifferent. The findings attempt to enable the meaning to emerge from the participants' focus groups. While demographic information was collected it was impossible to link each comment to a specific participant because the comments were transcribed from the voice recording of the focus group where everyone spoke together.

4.4.2.1 Results for Research Objective 1: A RA of CVEs to the 2D Internet for e-commerce may be the aspects of offline retail it includes that do not exist in the 2D websites.

There were comments relevant to this issue made throughout the focus groups. Participants perceived the RA of CVEs like SL in a number of ways. Firstly there was the level of enjoyment. One participant stated 'it is like being there in the shops instead of just looking at names of stuff in a two dimensional environment, so I think it's mostly about having fun'. This comment clearly relates the enjoyment to the inherent features of a CVE. Another participant identified another inherent feature, or functionality as something that increases the enjoyment: 'the idea of chatting is quite good you can talk to people that are also in the shop'. The next two comments follow on from the previous one and

add another feature ‘yes you can talk with your friends’, ‘it is more interactive...I think it is more fun’. Another participant made a broader related comment: ‘people enjoy the actual experience of shopping it is more like the real world’. A similar comment was also illuminating: ‘you get more of a sense of browsing in Second Life, instead of just clicking. These are the most typical comments related to this issue. In summary the participants considered that the aspects of the offline world that did not exist in two dimensional websites that were a Relative Advantages were the higher level of enjoyment related to the functionalities of three dimensional navigation and socialising.

4.4.2.2 Results for Research Objective 2: A RA of CVEs for retail compared to offline retail may be aspects of 2D e-commerce it includes that are not included in the offline retail environment.

The second objective is again related to participants’ perception of the RA of CVEs. This was once again based on both inherent functionality and more abstract personal views. Some issues were obvious: ‘it is late, none of the helplines would be open for the real world shop...you could go back to where you bought it in Second Life and ask someone’. The obvious but important functionality this participant is discussing is firstly, the availability of CVEs at all times, and secondly the ability to access them from the home unlike the brick and mortar retailers. While this is obvious it is important to gain insight on how it is appreciated. The history of e-commerce is littered with examples that illustrate that not all functionalities are valued. Another comment made a related point about the advantage of being on the Internet: ‘sometimes I send a link to my friends and say do you like this top?’ While it would be expected that CVE are less sociable than the real world it has in some cases an advantage. The next comment discusses the same functionality but shows that it is valued in a different way: ‘...if Second Life could guarantee that you could talk to a real person online then there would be a temptation because you would avoid having to walk to different places...’ While being online was first valued for twenty four hour access, here it is valued for convenience. Another participant valued the variety over the high street: ‘If you go out in Manchester there is a limited choice of shops, while if you try to teleport to any location then you can try to find people who sell

Swiss cheese and there is not a Swiss cheese person in Manchester.’ In summary the RA of CVE retail compared to offline retail that are aspects of 2D e-commerce that it includes that are not included in the offline retail environment are twenty four hour access, access from anywhere, more sociable for people that are not at the same location, more convenient and greater variety.

4.4.2.3 Results for Research Objective 3: Consumers may vary their intended usage of CVEs across the different stages of the purchase process because the significance of the dimensions of RA may vary across those stages.

Each channel has different characteristics and each stage in the purchasing process has different characteristics. It was therefore considered useful to explore how each channel was perceived to compare to each other at each stage. To research products and determine the requirements most participants chose the two dimensional Internet because of the volume of information that can be sifted through: ‘for something like a computer it is probably better online because you can then browse lots of different options and have a look at the full specifications of the product’. Some valued the opportunity to speak to a sales person ‘in a real shop, you can go in and then you can talk to someone that knows more about it’. In relation to selecting a vendor once the requirements were determined most participants focused on price: ‘posting and packaging, I would look for the best deal’, some considered SL to be at a disadvantage for this: ‘price is also an important factor you do not know if in one shop they will sell the same product cheaper...I think it would be harder in Second Life to compare’. Many participants pointed to the two dimensional websites advantage of having comparison websites: ‘2D websites are great because you can use comparison websites of independent people’.

For the next stage, product purchase concerns about convenience and trust arose. Trust is discussed in detail in section 4.4.2.5. For convenience the two dimensional websites were usually preferred to CVEs: ‘many people go online to save time and this doesn’t really’. One participant made an interesting point suggesting that if it is a product you are excited about, sharing the experience could

be more important than convenience: ‘things that, with which I have an emotional attachment and I am really excited to buy them! Maybe it would be a better experience to buy these in a 3D environment than a 2D environment, examples...and I have to get it online, I’d rather go to the 3D shop and be like ‘hey I got the...’. This comment illustrates how alongside unambiguous functionalities that most people appreciate in technology there are also more subtle, personal perspectives. This comment also illustrates the appreciation of the socialising ability of CVEs that was pervasive throughout the focus groups. Some believed that being able to communicate in a shop in SL with the seller was an advantage at this stage ‘you can talk with the seller, I don’t know if you could negotiate prices or something like that’. Finally many participants pointed out the important parameter which is the nature of the product: ‘it depends what it is because a clothes shop, obviously it would not work very well’. The type of product will be discussed further in the next section (4.4.2.4).

For after sales service the prominent issue was personal contact. The bricks and mortar shop was most peoples first choice. While personal contact was often hailed as a RA of CVEs it often came with the caveat of the sales person being there as this is not always the case: ‘if you can get a conversation going with someone that know what they are on about then this is better’. The participant here was comparing two dimensional websites to CVEs. Some however preferred two dimensional websites and resolving issues by email: ‘...2D because you can just email them’ and ‘if you want to get in touch with them online you might keep on just missing them’. These comments may seem opposite but the important thing is to extract meaning. The meaning in this case seems to be that if someone wants to inform a vendor of something, they may prefer asynchronous communication like email, and hence two dimensional websites. If they need to discuss something they may prefer face to face, or as a second best avatar to avatar. There are two further disadvantages of SL in relation to this: Firstly the use of bots to give the impression that someone is there and secondly the limit of 50 stored messages.

4.4.2.4 Results for Research Objective 4: Consumers' usage of CVEs may be different for simple and complex products.

For complex products most participants valued being able to speak to a person: 'for a complex product like house insurance obviously the advantage would be with the traditional face to face, although Second Life may have an advantage over 2D websites'. This comment illustrates how CVE are often perceived as more personable and emotive than two dimensional websites but less than the offline world. Another comment illustrating this: 'I think I would prefer 3D it is more like phoning someone and saying well what is your house insurance like? You would not have to go through...working out exactly how it works'. Once again the participants are astutely comparing the features of each channel to the task at hand and making a selection. Some once again referred to comparison websites and their ability in some cases to handle complex products: 'In comparison websites you can type in say what your occupation was, all the rest of it and it tailors it for you.' Again we see participants having preferences of certain functionalities, or features of different channels.

No specific advantages of SL for simple products were identified. The general RAs that were stated in other sections also apply to simple products but none differentiated between the two. Most participants stated they would buy simple products they usually buy online: 'books something like that you're reading it, or a DVD, but not clothes'.

4.4.2.5 Results for Research Objective 5: CVEs such as SL may have the RA of a higher degree of Institutional Trust compared to the 2D websites.

The literature indicated that some features of CVE could increase trust. The literature identifies institutional trust as an important factor (McKnight et al., 2002). The creators and owners of CVE are institutions and could hence influence trust. This was considered to be an issue worth exploring. Many participants identified the payment method in SL as a feature that enhanced their trust. This is a feature of the channel and can be considered an aspect of institutional trust: 'the payment method...is

more safe because if the retailer does not have your bank detail then you don't have to worry from [sic] him'. Other participants also identified the different security issues in SL and the role of the CVE owners: 'it also relies upon trusting the site so as Second Life is owned by a company and it has a security set up then I think you would probably buy.'

A small number of participants saw a disadvantage: 'all these shops in Second Life, how can you trust that the real shops have given them a licence?' and 'it is obviously going to be easier to fake stuff online'. This point is not related to trust in terms a breach of payment security but in terms of the prominence of companies in a relatively new channel. Once again the analysis can develop the understanding of the meaning despite views that are in some aspects opposite. Based on the focus groups we can conclude that in terms of payment CVEs may have an advantage but in term of company and product prominence they may have a disadvantage.

4.4.2.6 Emergent issues

One of the most common responses to all the objectives of discussion in the focus groups was to relate the sales person in SL. It was mentioned thirty four times. It seems that many participants value this feature of CVEs: 'It is nice to be able to interact with someone in this world', 'so when there is a sales person there you appreciate it'. It seems to be a key feature that differentiates CVE from the two dimensional channel.

Another common theme of the focus groups was the participants differentiating the current implementation of CVEs, in this case SL to their perceived ultimate potential. This was to be expected as CVEs are a channel that may not be new but it has not matured both in terms of technology and the way the technology is utilised. There were twenty four comments related to this issue. Some characteristic ones are: '...it is just that the technology is not there yet, thru scanning your body, like in the shop and then getting your ID and going back to the computer...', '...now the trousers look like 2D objects', '...at least it resembles you more closely, and then I can see that would be very, very

useful...’. Most of these issues are food for thought for the CVE owners rather than the retailers using that platform. The retailers cannot implement something if the technology is not there. It is useful however for the retailers to have a long term vision to move towards step by step as the underlying technology inevitably moves forward.

The third emergent issue was the influence of brands. Beyond the features of the channels identified it was important to also take into account the role specific companies play. While this was not the focus of this research, and it could not therefore be explored in depth, it had to be noted. Unsurprisingly the company that was referred to many times, twenty four in fact, was Amazon. Because of its dominant position in online B2C retail it seemed to be the de-facto benchmark for customers. For example when the participants were asked about which channel they preferred for after sales service some referred to Amazon: ‘unless you have a really good return policy like Amazon where...they provide you with the barcode’. Some other comments: ‘in amazon you get to read reviews’, ‘Amazon do a package deal if you buy many things...’, ‘with amazon the sellers are verified’, ‘Amazon have this cool feature where they suggest things you might need’. Despite this not being the focus of this research it was important to be aware of the prominent position Amazon had in consumers mind.

4.4.2.7 Conclusion

The findings presented here were a succinct summary of forty eight transcribed pages and therefore an additional comprehensive summary was not attempted. There were some broad issues that could be identified. Firstly the participants showed an interest and ability to identify the features of each channel, assess what those meant to them, and compare them to the specific issue under question. Beyond this making the data richer this is a strong indication that this thought process happens naturally when making a purchase. This strengthens the argument that this research has a valuable contribution to make. While no conclusive findings could be claimed after the focus groups the richness of meaning drawn out in relation to the five objectives explored was another indication of the value of this research. Some features that were pervasive across all issues discussed had to be noted.

These were the ability to socialize in CVEs, the richer more personal interaction and the value of the shopping assistant. All these issues were further explored in the interview stage.

4.4.3 Interviews

The findings discussed are based on the interviews in SL. The responses from the interviews were useful but varied. On a small number of issues there was consensus, such as the unsatisfactory quality of the images and on the rest there were varying, often conflicting views: ‘I like it because it is more like going to the real shop’ (female, 21), the polar opposite ‘but the whole point of shopping online is that it is not like the shops’ (female, 22) and, seemingly, everything in-between ‘if you do not want to go to the shops either because they are closed or it is a Saturday and they are busy, this would give you a richer experience’ (female, 19). These conflicting views were often based on different motivations and expectations as these quotes illustrate. Therefore it was hard to be conclusive about some of the useful themes that arose.

That however was always going to be the case for a number of reasons: Firstly the methodology. This has been covered in other sections. It would suffice to say that these were the first two out of three phases of data collection and they were therefore intentionally broad in order to start with fewer preconceptions. More conclusive findings would result from the survey. The second reason that the findings were, to some extent, inconclusive, was down to the nature of what is being measured. As a technology CVEs are still in their infancy and the way they are being applied is evolving and hence people’s experiences are varied. This point was made clearer when one contrasts the participants’ views on the ‘immature’ retail in SL to the ‘mature’ retail in 2D websites, especially Amazon. The clarity of people’s perception about 2D websites such as Amazon as a channel was firstly because of the standardised experience they provide and secondly because of peoples extensive experience with them.

In addition to the two types of general responses, general agreement and a narrowing of the topic, or general disagreement and broadening of a topic there seemed to be a third type of response: This was taking a position with one or more conditions, or caveats attached. This was again a result of the fluid evolving nature of SL as a retail channel in comparison to the more ‘solid’ or ‘rigid’ 2D web, or offline retail channels. Therefore many responses were of the format if <condition> then <position>. A common response in this format was ‘if the shop assistant is there, if it is more immediate, then I would prefer Second Life for...’ (female, 21).

Therefore, based on the methodology and the particular issues discussed the analysis and discussion of the data was in two overlapping stages: The first stage attempted to present the key themes related to the templates. The quotes used were chosen because they were typical of many beliefs on that objective. This does not suggest a generalizability of the results, because the sample is too small for that. It was important however because in this way the data captured was represented as accurately as possible. The second section focused on one theme that warranted detailed discussion on its significance and usefulness. There were five objectives and a large amount of the data was relevant to them. Some characteristic responses from each theme that were relevant were presented. The first objective follows.

4.4.3.1 Results for Research Objective 1: A RA of CVEs to the 2D Internet for e-commerce may be the aspects of offline retail it includes that do not exist in the 2D Internet.

The first objective that was identified from the literature was significant because it proposed a RA of CVEs in the simplest form, offering a high level category of RAs that could include many more specific RAs. Many participants’ responses were on this objective and subcategories were identified. These were primarily enjoyment, which will be discussed in more detail in the following section of the findings; social shopping, a richer and more emotive 3D environment, ‘face to face’ and the shopping assistant, and to a lesser extent location. For the ‘social shopping’ and ‘richer more emotive environment’, there was extensive evidence. An example of the former is: ‘...you can actually view

the products with other people, even if they are just virtual representations...' (male, 26) and 'I was thinking it could be more sociable, you can't really go with friends around Amazon' (female, 22). As the second quote illustrates the ability to go shopping with their friends was considered an advantage. This could be especially useful when those friends do not live near them and would therefore not be able to shop together offline.

In the case of the latter, which channel was most emotive, all participants considered the real life to be first, which is understandable, and most considered CVEs such as SL to be more emotive than 2D websites. One participant stated in response to the question about which is more emotive: 'Virtual worlds but only because the 2D websites have no emotion at all' (female, 22). One other participant was more enthusiastic: 'Yes it is more interactive, I guess, you control your avatar, you walk into the shop you walk around, you can fly if you get bored. I think it is more fun' (female, 19). Those that did not consider SL to be more emotive than the 2D web pointed to the shortcomings of its current implementation: 'SL last at the moment because it is slow sometimes' (male, 28), and '...occasionally you find someone in a SL shop interested in helping you but you don't get their full attention. They usually have instant messaging going on, maybe music streaming' (male, 60). Since the reasons given were about the current implementation and not the fundamental nature of a CVE it suggests that if these issues were overcome those participants may also agree with the rest.

That last quote leads on to the third RA of CVEs compared to 2D websites for retail identified: That of 'face to face'. The most prominent of those interactions in relation to retail was interacting with a shopping assistant in a CVE. In addition to the shopping assistant there were positive comments about the ability to communicate to the person that created the product being purchased 'face to face'. The first point to clarify is that what is meant by 'face to face' here is virtual face to virtual face. More importantly it means communicating to a real person, in real time. In other words synchronous communication, possibly by voice and some, virtual, body language as opposed to the asynchronous forms mostly used on 2D website browsing, such as email. One participant said: 'SL can offer one on one contact with the seller where you would have to telephone someone in real life when shopping

online, if you needed further information, one on one.’ (male, 62). The same participant went further giving a reason why the one to one contact felt better: ‘Second Life can bring intimacy to business relationships between companies and individuals who are physically maybe thousands of miles apart. By intimacy, I don't mean anything rude! Just as we are in the same ‘room’, now’ (male, 62). Regarding the benefits of talking to the creators of the products ‘face to face’: ‘The creators are often around to help, and most vendors have groups set up, so anyone can begin a group discussion on a product, and other customers can join in and offer advice too’ (female, 21). There were also some participants who did not believe it was a benefit: ‘Second Life shops, they enable you to view the product, usually without the influence of shopkeepers’ (male, 26). When asked whether they liked shopkeepers in SL in a follow up question the participant clarified their belief further: ‘No, I find it irritating, some shops hire people to do that, usually for renting land and the likes’ (male, 26).

Lastly two more RAs compared to 2D websites that were less prominent but useful nevertheless were location and the nature of navigating a 3D environment and the way it influences your experience of information. Regarding the benefits of location one participant’s response was very enlightening: ‘...unless you pay a lot of money for a shop in a high traffic area you don't make much I guess... I think there are some places where people shop as they would in Real Life...They wander and browse and hopefully buy... Maybe because all the better stuff, the stuff you pay a lot for is in the places where you pay more to rent... Maybe because Second Life is so huge that these high traffic places are successful because people want all the good stuff in one area. It's easier; all the shops with the fashionable stuff are in one place. You get seen there, I guess that matters to some people’ (female, 24). That quote emphatically shows that parallels between the real world and CVEs for retail. This is not just stylistic or visual but functional. Regarding the related point of navigating a 3D environment: ‘I like pretty shops, well designed architecture, well laid out. I dislike shops that have no navigation’ (female, 55) and ‘All depending on the shop really, most of them are set out nicely so you can see the sections nicely, men and women etc., and prices...’ (male, 24). These typical quotes illustrate how the layout is both pleasurable and functional.

4.4.3.2 Results for Research Objective 2: A RA of CVE retail compared to offline retail may be aspects of 2D e-commerce it includes that are not included in the offline retail environment.

The second objective that was identified from the literature, like the first, proposes a RA of CVEs in retail in the simplest way, offering a high level category of RA. It is equally significant to the first but far simpler. The nature of the technology of CVEs operating on the Internet guarantees that they will contain some of the Internet's benefits compared to offline. It is therefore not controversial or likely to be disputed in any way since it is based directly on the functionality of the technology and not its implementation by a retailer. As we have seen when the issue in question results from an implementation of a technology the users' perceptions tend to vary. The data collected is nevertheless useful as it illustrated this point with empirical evidence. Unsurprisingly there was ample data on this objective. Three related RAs found were convenience, speed, 24-7 availability and global reach. Characteristic responses were: 'You could meet your friends...if they are in a different country' (female, 19) and 'the fact your sat at home and able to check out other places of interest without dragging family from shop to the next, so peaceful' (male, 38). Another RA in relation to offline was the ability to access additional information such as reviews and profiles: 'I could read the profile of the vendor... you can't do that in real life!' (female, 22).

4.4.3.3 Results for Research Objective 3: Consumers may vary their intended usage of CVEs across the different stages of the purchase process because the significance of the dimensions of RA may vary across those stages.

Since this research was qualitative, in regard to the third objective the purpose was not to conclusively identify the most popular channel for each stage. The purpose was to investigate whether people vary their usage, whether there was an outright winner and importantly the explanations the participants gave for their beliefs. That is the strength of qualitative research and why it was chosen. If people prefer different channels for each stage this would be a strong indication of the benefit of retailers utilizing a multichannel approach. The third objective was illustrated by participants primarily in response to question eight which asked about the stages in the purchasing process. Secondly,

following on from that, the question asked the participants to map the stages of their purchasing process, as they understood it, onto the three retail channels in question. There was evidence that participants had an evaluation of each channel's advantages and disadvantages and chose the one they would use for a given task accordingly. They often did not have an outright favourite for all the stages. What could be considered surprising is that no participant chose the same channel for all stages.

This was shown firstly in individual responses. For example 'online shopping is the best as you can really research the goods you buy' (male, 60), 'for browsing the 3D could be more fun' (female, 22), and 'for the purchase stage I prefer to go to the shop because you get what you buy instantly' (female, 22). Beyond the individual comments there were some aggregate patterns for each stage. Some considered SL to be good for payment: 'The payment in SL is probably the easiest; just two clicks, no filling in your card number and so on. It is slightly quicker and easier' (female, 26). Many considered SL as the best channel for after sales service: 'For after sales service, hm. If I wanted to return something I would like to send an email or a letter. If I wanted help to solve a problem, or help to show me how to use it then I would prefer something more direct like the phone or SL.' (female, 26). This quote illustrates how the ability to communicate with a real person, in real time 'face to face', which was identified as an RA in the first issue, plays a significant role here. The related point, of being able to contact the creator of the product directly was also stated as a benefit again: '... the fact that there's no hours waiting for customer support at a call centre, the ability to contact the creator directly.' (male, 26). Contacting the creator of the product directly is of course not a standard characteristic of retail in a CVE channel but a special case. In response to the questions about the purchasing stages some participants believed it depended on the type of product. This indicates the significance of the fourth objective which will be discussed now.

4.4.3.4 Results for Research Objective 4: Consumers' usage of CVEs may be different for simple and complex products.

Regarding the fourth issue identified from the literature, most participants considered the two dimensional websites and offline as best for simple products: 'If I knew what I wanted, so let's say the new Dan Brown book and I just had to buy it then the 2D Internet. 'It is the most practical' (male, 28). For complex products overall most participants considered the offline world as the best. Some considered two dimensional websites better because you can get more information in a shorter space of time: '...2D, purely because of the increased amount of data that can be viewed in a reasonable amount of time' (male, 26). The other reason given for preferring 2D was that they preferred to absorb information in text form: 'when you are using the 2D websites at the moment all the information comes up...' (female, 19). There is of course information in two dimensional text in Second Life but there is usually some navigation involved before it can be consumed. Some participants championed the benefits of comparison websites: 'you can use comparison websites from independent people' (female, 21).

Those that considered CVEs to be better than two dimensional, believed this primarily because of the shopping assistant once again: 'SL can offer one on one contact with the seller where you would have to telephone someone in RL when shopping online, if you needed further information' (male, 62) and 'I do not know anything about laptops, so if there was someone there...' (female, 22). Within those that had that opinion some considered the ability to negotiate with a real person in Second Life as beneficial in the purchase of a complex product: 'Being able to negotiate with a real person in SL is a benefit. Sometimes you can talk to the creator of the product and they will answer any questions you have so you can be more confident about what you are getting into' (female, 21).

4.4.3.5 Results for Research Objective 5: CVEs such as SL may have the RA of a higher degree of Institutional Trust compared to the 2D websites.

In contrast to the previous objectives based on the literature there was less data relevant to the fifth one. Unlike those this one was about perceptions of implementations of technologies. Hence there was a range of implementations and impressions. There were four types of responses. The most common was to group the two dimensional and three dimensional together because the underlying technology was the same: ‘I don’t think it would make a difference, because if you think about it logically it is just a different interface’ (female, 22). There were some that trusted two dimensional websites, the most common reason being that it was more established: ‘the two dimensional because it is tried and tested everyone knows it is safe, while as this is quite new, it does not have a reputation’ (female, 21), and the ability to read feedback. There were some that preferred the CVEs sighting the payment system: ‘the company you buy the products off don’t see your bank details, so that would be fine’ (female, 19). Some highlighted how SL the ‘institution’ influenced ‘institutional trust’ positively: ‘...I was very unsure when I first started purchasing on SL, now unless there is a problem that has been highlighted with the grid, I generally don’t have a problem with SL...’ (female, 22). What the participant was referring to here was that Linden Labs informs users about retailers that are not trustworthy. This illustrates how the fact that SL is owned by Linden Labs and has the potential to cultivate greater institutional trust. That logic was the reason why this issue was identified as an area to investigate.

Despite the varying opinions about how trustworthy SL was for retail there was only one specific problem mentioned and that was specific to virtual products: ‘In most cases on SL, what is sold is no transfer, so you cannot be refunded for anything. You cannot exchange anything etc.’ (female, 21). Despite this being a valid concern this is inevitable at the moment. Retailers that sell virtual products need to block the right of the buyer to sell it on or duplicate. Furthermore returning a virtual product is difficult, the easiest way is for the person that purchased it just too delete it but then there is no way for the retailer to verify this. Lastly an emergent theme which came both from the specific question on

trust and other responses was valuing brands above channels. In other words participants trusted brands regardless of the channel being used. The most common brand cited being Amazon: 'I think it goes by experience and reputation, we know Amazon is reliable in shipping things so we trust Amazon' (female, 22).

4.4.3.6 Emergent issues

The emergent themes identified one additional RA of CVEs for retail, that of enjoyment or fun. This emergent theme falls under the first objective but it is especially significant and will be discussed further. The first objective assessed whether the RA of CVEs for retail being aspects of the offline retail which they incorporate. While it may not be immediately apparent why 'enjoyment' is a characteristic that comes from the elements CVEs mirror from the real world this was shown by the participants comments: 'I suppose it is a little bit like a game so it is more enjoyable than just clicking on something like Amazon and buying something, without browsing or doing anything else' (female, 22), 'one advantage would be, say people enjoy the actual experience of shopping, it is more like the real world' (female, 21), 'Buying online is just an exercise in box ticking. Need that product. Found that product. Bought that product. But for me, as anything I buy in SL is bought purely for pleasure, I always get a bigger kick out of it.' (male, 37).

Research suggests (Koufaris, 2002), enjoyment is a factor in online purchases. Further research, (Holsapple and Wu, 2007; Guo and Barnes, 2009) identified enjoyment as a possible construct for consumer behaviour in CVEs. Along similar lines to that it has been suggested (Kim and Forsythe 2008), that 'entertainment' can be enabled in retail by CVEs and further research (Bourlakis, et al. 2009), suggests retail in CVEs may be more experience orientated as opposed to either customer or product orientated. The second research (Bourlakis et al. ,2009), did not have empirical evidence to support this and encouraged that to be done in their conclusion. The constructs put forward by Kim and Forsythe (2008) and Bourlakis et al. (2009) are similar to that found by this research but different. Nevertheless because of the close similarity they support each other's validity. This research found

empirical evidence to support previous findings about the role of enjoyment in this context (Holsapple and Wu 2007; Lee and Chung 2008; Guo and Barnes 2009) and beyond that found evidence that enjoyment is a RA of CVEs compared to the other channels. The reason why the emergent theme of ‘enjoyment’ makes a significant contribution is in relation to the model this research is based on Choudhury and Karahanna (2008). It makes a contribution to this model which is supported by literature beyond those already mentioned (Koufaris 2002; Holsapple and Wu 2007; Guo and Barnes 2009). The model used, as put forward by Choudhury and Karahanna (2008), stated that for the purpose of assessing the RA of channels for retail:

$$\text{Relative Advantage (RA)} = \text{Convenience} + \text{Trust} + \text{Efficacy of Information}$$

Those with an awareness of TAM would immediately identify that:

Convenience is similar to Perceived Ease of Use (PEOU)

Efficacy of Information is similar to Perceived Usefulness (PU)

And since: $\text{TAM} = \text{PEOU} + \text{PU}$, Choudhury and Karahanna (2008) could be rewritten as: $\text{RA} = \text{TAM} + \text{Trust}$.

Finally, since TAM is part of Choudhury and Karahanna 2008 the extensive literature of TAM can be used in relation to it. This is useful here because many models of TAM include ‘enjoyment’ as a variable, Perceived Enjoyment, (PE). This is related to PEOU: ‘PE has been theorised and empirically validated as either an antecedent or a consequence of PEOU’, (Sun and Zhang, 2006). Hence ‘enjoyment’ is proposed as an addition to this model in this context:

Choudhury and Karahanna 2008 model for assessing the RA of channels:

$$\text{RA} = \text{Convenience} + \text{Efficacy of Information} + \text{Trust}$$

Similar and logically compatible with:

$$\text{RA} = \text{TAM} (\text{PEOU}(\dots + \text{PE}) + \text{PU}) + \text{Trust (Institutional Trust)}$$

A potential model based on this research for assessing the RA of channels:

RA of retail channels = Convenience + Efficacy of Information + Enjoyment + Institutional Trust

Also similar and logically compatible with:

RA = TAM (PEOU(...+ PE) + PU) + Trust (Institutional Trust)

This model emerged from the data. It has been discussed in response to answers participants gave to a number of questions some of which were very general and hence did not encourage such a response. It is also supported by the literature through the logic illustrated. As the literature review section indicated there are many constructs that can be included to research models related to TAM. Beyond a constructs validity being supported in the literature it is important that the construct considered is significant enough for the specific purpose being used, in this case RA. This research indicates, but does not prove, that this construct is significant enough to be included for the specific purpose of identifying the RA of retail channels. It must be stressed that this is not a contribution to TAM as that is in not the objective of this research. This is about selecting the ideal model to compare retail channels, that includes an existing version of TAM best suited for this. A question which may arise is how great or small such an addition is. The answer would be that the right tool has been chosen to achieve a task. It is a means to an end and not an end in itself. Getting that right however is the determining factor in achieving the task.

Beyond being coherent and valid this addition is significant because the data suggests this is an existing, empirically identified, RA of CVEs in comparison to the two dimensional Internet. The initial data suggests CVEs in their current form have notable disadvantages such as: The quality of the images of the products, 'if this is the graphic that I can achieve I would prefer 2D', (female, 19) and the speed of making a purchase: 'depends on how the sim works, sometimes there too much lag so kills [sic] the moment', (male, 28). At the same time there are few advantages making this existing RA of CVEs for retail a useful contribution of this research.

4.5 Conclusion

In many cases when participants were asked which channel they preferred for a particular situation they gave a variety of answers. It may seem that this is an inconclusive response but that is not the case. Since this is qualitative research, despite the relatively large sample of 38 overall no quantitative conclusions should be drawn. The value of this research and the qualitative method it uses is that participants gave the reason why they believed one channel was better in one sense. A good example is after sales service. This analysis could not conclusively state which channel was ideal for this. It could however, suggest, based on the empirical data collected, that the participants who thought CVEs were the best channel for after sales service believed that because they valued the convenience of the Internet and the ability to communicate with a person in real time, 'face to face' that some believed was more intimate.

The main contribution of this research is identifying and analysing five objectives that capture the areas of RA that should be considered when comparing these three retail channels. The first objective identified was that the RA of CVEs to the two dimensional Internet for retail were aspects of the offline world that it included. These are primarily enjoyment social shopping, a richer and more emotive three dimensional environment, 'face to face' and the shopping assistant, and to a lesser extent location and navigation. The second objective was that the advantages of CVEs compared to the offline world for retail were aspects of the two dimensional Internet that it included. These were found to be convenience, speed, twenty four-seven availability and global reach, and additional information such as reviews and profiles. The third objective was that consumers would vary their use of CVEs across different stages of the purchase process because the RA would vary across each stage. Some considered SL to be good for payment after sales service. The fourth objective was that consumer's usage of CVEs may vary for simple and complex products. Most participants considered 2D websites and offline as the best for simple products. For complex products overall most participants considered the offline retail as the best. Some considered 2D websites better because you get more information and you can use comparison websites. Those that considered CVEs to be better

than two dimensional, once again valued the ability to negotiate with a real person such as the shop assistant which they found especially beneficial for complex products. Lastly the fifth objective is that CVEs such as SL may have a higher degree of institutional trust compared to the 2D websites. There were four types of responses. The first and most common were to group the two dimensional and three dimensional together because the underlying technology is the same. There were some that trusted the 2D websites more than CVEs the most common reason being that it was a more established technology. A second reason for this was because they valued the ability to provide feedback that many 2D websites offer. Those that preferred the three dimensional retail of CVEs sighting the payment system and some highlighted how SL, the 'institution' influenced institutional trust positively.

Considerable evidence was found to illustrate these issues. The range of preferences in the retail channels in general, in relation to the purchasing stages and product complexity and the lack of outright 'winner' with complete RA indicate the value of a multichannel approach for retail. The value of a multichannel approach has been identified (Teltzrow et al., 2007; Schoenbachler and Gordon, 2002; Tang and Xing, 2001), but it is investigated and proved here for three reasons. Firstly this research illustrates that CVEs have a position alongside the other channels. Secondly this research illustrates how simple and complex products influence the consumers' choice of channel. Hence it is useful to analyse the three channels separately for simple and complex products. Therefore we propose six dimensions should be investigated (three channels by two types of products). Thirdly this research gives some indications about what the nature of that position should be. A secondary contribution that emerged from the data was made in identifying an extension of the Choudhury and Karahanna (2008) model to include emotional reactions to be effective when considering CVEs. Therefore, further research will use the extended model to compare channels for retail. The proposed model is: Relative Advantage of a retail channel = Information Efficacy + Convenience + Institutional Trust + Enjoyment.

CHAPTER FIVE - QUANTITATIVE RESEARCH

5.1 Introduction

The quantitative analysis was applied to the sample survey data. The survey questions arose from the qualitative data collection and analysis. Some were directly related to the 5 overarching objectives and some were not as they emerged from the qualitative data and had not been predicted. Each question added to our understanding directly and was an end in itself. Therefore each question was analysed and discussed individually. Those that were related to the objectives served to evaluate firstly their significance in absolute terms and secondly their significance between the three channels following the principles of the comparative case study analysis methodology.

While the qualitative section identified the issues related to the relative advantage of the retail channels gauging the significance of each of these issues would be achieved more successfully with quantitative methods. This can be described as adding the ability to generalize to an in-depth understanding (Bazeley, 2004). The qualitative part could be considered exploratory and the quantitative part could be described as both exploratory and predictive (Black, 1999).

The literature on quantitative methods offers a clear path to selecting the right form of analysis by comparing the capabilities and limitations of each method with the research goals. For comparing one group, from a Gaussian, normalized distribution, to a hypothesis the choice indicated is the one sample t-test. If the data could not be assumed to be normalized or was ordinal a Wilcoxon signed rank test, or Wilcoxon t-test would have been used. Other methods would be useful but not an ideal fit to the requirements.

The next section discusses the design and implementation of the survey to collect the data. Following on from this is an overview of the steps taken to prepare the data to be analysed. The next sections

cover the different analysis methods used. Firstly descriptive analysis was applied, followed by analysing the data by demographic groups. The next method was cluster analysis. This method would help explore the data and find clusters of participants with similar beliefs. These additional methods were part of the exploratory approach looking for possible patterns and relationships. The last and most extensive analysis is that of comparing the three retail channels on key variables. The findings are discussed in the conclusion.

5.2 Data collection

5.2.1 Survey design

The survey was created by a process of designing testing and redesigning. The data collection goals were based on the objectives and the issues that arose from the interviews. Therefore the iterative process of survey design was in turn part of a broader process of refining, developing and verifying. For an issue from the interviews to be included it had to be considered to be useful, in terms of the insight potentially gained or significant, in terms of how many participants shared the view and how important it was for them. As the samples in the qualitative data were small quantifying them did not offer a robust scientific measure of the significance of the issues. The large size of the survey however enabled all the issues that had potential to offer insight to be accommodated. The survey was first checked with the two PhD supervisors and then tested with 18 participants.

The large size of the survey, sixty questions, was chosen because it was predicted that the participants would have a high level of commitment. This was because the participants were being paid and they had been vetted by the survey agency that considered them to be responsible and knowledgeable. The survey can be found in appendix C in the form that it was seen by the participants. The survey data can be found in appendix F. Fifty nine questions were compulsory closed ended questions where the

participant answered by selecting a point on a scale that represented their views. This was done mostly by using a slider enabling the data to fit a Gaussian scale better than if they had to choose from a limited set of options such as a five point Likert scale that is often used in surveys. The sixtieth question was an optional, open ended question that allowed the participant to add anything they wanted to share that was not covered in the survey.

The first 12 questions enquired about the participant and their use of SL. The first four covered the gender and age of the participant and their avatar. The next eight covered how long, how intensely and for what purpose the participant used SL. After those demographic questions the first section of the main survey had ten questions covering different aspects related to purchasing products from SL. The feedback was given on a scale from 'strongly disagree', minus fifty, to 'strongly agree', fifty, using a slider. The second section of the main part of the survey focused on the RA of the three channels by directly comparing them. There were fourteen questions about different aspects of purchasing a product. Under each question there were three sliders one for each retail channel, offline, online 2D website and SL. The participant chose the degree to which they agreed with the statement in the context of each channel. The scale was the same as in section one. Topics included convenience and contrasting a simple and a complex product. The third section had twenty two questions and it compared SL to one of the two other channels, one at a time. The reason for the difference between the third and fourth section was that some vignettes could not be phrased in a way that would allow all three channels to be compared in one question. The topics of the questions include convenience, navigation and delivery.

The demographic and experience questions were used to assess whether there were any correlations between those characteristics and responses to the questions. This was done by first grouping the participant by a category, such as age or level of experience and then comparing the responses. An example of a possible result would be to conclude that more experienced users found the purchasing process more convenient than less experienced ones. The mean, the standard of deviation, ANOVA

and cluster analysis were used to explore the data. For the second and third sections the analysis compared between pairs of channels using the t-test.

The second section had three scales for each question. The three scales were divided into three pairs in order to carry out the two group t-test. This is both statistically and logically sound. The purpose is to identify an RA of one channel compared to another. The pairs were the first scale with the second, the first with the third and the second with the third. The two means that resulted from the responses to the two scales were compared using the t-test in order to determine whether those means represented different populations. In other words was the difference in the responses to the two scales significant enough to conclude that the two variables represented by the two scales were perceived differently. A possible conclusion of this analysis would be that customers find offline retail more convenient than that of SL.

5.2.2 Survey dissemination

The survey was hosted on the Manchester Business School survey disseminating website. This website was provided by a company called Qualtrics (Qualtrics, 2010) and used their software. The survey had a target of 550 participants and was administered by Reperes. Reperes sent a message from within SL including a link to the survey to potential participants that met the requirements set. The first requirement was for a minimum of six months experience in SL. This could be verified by checking when an avatar was created. The second requirement was for the participants to have made a purchase of a product in SL. This was checked in question 10 and as the following section shows 97% stated that they had made a purchase in SL. While it could not be ruled out that some participants had been dishonest the high percentage proved, at the least, that Reperes had communicated this requirement. Reperes were also tasked with keeping a balance between male and female participants. Once a participant had completed the survey they entered their avatars name. The list of names was given to Reperes and the participants got paid in Linden dollars. Reperes continued to sending this

survey until this amount was reached. In the end the goal was surpassed and 616 participants took part.

5.3 Data preparation

Before the data could be analysed it needed to undergo some preparation. In this process the stages prescribed by research literature were followed (Black, 1999). The process was influenced by the nature by which the data was collected and placed into a data set. As discussed in the previous section the participant completed the survey online using the MBS Qualtrics online survey software. The software collected the data and populated a data set automatically. The data set was then exported as an SPSS file. Firstly, this meant that the participant could not enter values that were not valid. Secondly, as the researcher did not populate the data set manually the risk of human error was avoided for this stage.

The steps implemented were screening and cleaning. The first step, screening, involved checking whether there were values in the data that lied outside the valid range. Once they were found they would either be deleted or corrected. Because of the reasons discussed in the previous section and the reliability of the software no errors were found. There were however questions that had not been answered.

Surveys that were not completed were taken out of the data set. This was a relatively small number 39 (590, 591, 592, 594, 595, 613, 616, 618, 619-646, 649, 650, 652-654) out of 655. For these 39 cases only one response was made. That was to click on the button that took them past the first page that had some instructions. Since the hyperlink to the survey was sent to a mailing list of potential participants, one possible explanation is that they opened the survey and decided not to complete it. This could be interpreted as 'first-level non response' as the participant did not cooperate (Lessler and Kalsbeek, 1992). Therefore 616 participants can be considered to have taken the survey.

There were participants that completed the survey but neglected to respond to a number of questions. These can be considered ‘second-level nonresponse’ (Lessler and Kalsbeek, 1992) and item non response (De Leeuw, 2001). Since that survey was online and the dataset was populated automatically it is unlikely that this data was entered but then lost. Furthermore it was not possible for the participant to enter values outside of those permissible. Thus by method of elimination the possible explanations left are: they were skipped on purpose, by mistake or because the answer was unknown. A small number of participants, 6, skipped a large amount questions. In terms of patterns in relation to questions there was a larger than average failure to respond to question 15. This question was simpler and easier to understand than other questions that had a good response which suggests that the participants understood it but did not have an opinion. The missing data from six participants that skipped many questions and the missing responses to question 15 can be considered non-random, (De Leeuw, 2001). The rest of the missing data can be considered as missing completely at random (De Leeuw, 2001). For the later cases the absent data can be ignored (Little and Rubin, 1987). These steps were taken within SPSS in the typical way used to check for errors (Pallant, 2007; Field, 2009), such as checking the minimum and maximum, the number of valid and missing cases and checking for values out of range.

In order to apply analysis with inferential, predictive capacity the data needed to be normally distributed. This is an assumption of the methods that can achieve this. According to the central limit theorem if the sample data is approximately normal so is the sample distribution. Furthermore in a big sample the sampling distribution is usually normal regardless of the distribution of the sample collected (Field, 2009). Lastly it is considered that for large samples, over 30, the methods are sufficiently tolerant and robust for this assumption to be violated (Pallant, 2007). Nevertheless the data were tested for normality. For large samples using graphic method such as histogram or a Q-Q plots are usually preferred as other methods such as Kolmogorov-Smirnov and Shapiro-Wilk, because those methods can show a significant deviation from normality even when this deviation is very small (Field, 2009).

A second assumption was that of the level of measurement requiring continuous rather than categorical data. This was met to an absolute degree with the use of sliders. The randomness of the sample was met by the way Reperes disseminated the survey. The observations were independent as the survey was disseminated over the Internet. Lastly in relation to homogeneity of variance the data was collected at one point in time. Furthermore, as is the case with normality these methods are robust to this assumption being broken (Pallant, 2007). Nevertheless, as with normality, this was tested using the Levene test (Field, 2009; Levene, 1960). For the dependent-means t-test discussed in section four of this chapter it is not the scores themselves but the difference between the scores that should be normal. Again a large sample should ensure this. For this type of t-test the assumptions homogeneity of variance and independence of scores are not relevant (Field, 2009).

Many of the survey questions used sliders. These sliders values were from -50 to 50 for reasons explained in the data collection section. This resulted in positive, negative and zero values in the data set. Before the data could be analysed these needed to be transformed so that all the results were positive (Field, 2009). Therefore -50 was transformed to 1, 0 as 51 and 50 as 101. This was done after the preliminary analysis for the subsequent sections that used the t-test, ANOVA and cluster analysis.

5.4 Data analysis

5.4.1 Preliminary analysis

The preliminary analysis involved descriptive statistics. These are usually the first stage in the quantitative process as they attempt to summarize and present the data without inferring about the population the sample came from. As discussed in the previous section there are a variety of types of questions such as categorical, numerical measuring one variable and numerical measuring multiple

variables. Different descriptive statistics were used depending on the nature of the question. The large number of questions necessitated the use of tables to illustrate these results as shown below. Questions with the same form of results were combined into one table. The results of the descriptive analysis support one of the findings of the qualitative section. This is that participants have a distinct perception of the purchasing experience for each channel. The survey question and maximum and minimum values available were included to give a sense of the survey alongside the data that was collected. Questions 24 to 59 are not discussed here as they are analysed in terms of means and variance in a more sophisticated way in the following sections.

The responses to question 1 and 2 are shown in table 5.1 below. The responses to question 1, ‘what is your real life age?’ show that the distribution of ages of the participants was satisfactory and this enhanced the representativeness of the sample. For question 2 ‘what is the age your avatar appears to be in Second Life? (If you have more than one answer for the one you use the most)’, the avatar ages show a high concentration from 25 to 34. This could be out of preference or because of the limited ability of the graphics to show aging.

Table 5.1: Responses to survey questions 1 and 2

	Question 1		Question 2	
Answer	Response	Percentage	Response	Percentage
Under 18	6	1%	16	3%
18 to 24	115	18%	128	20%
25 to 34	200	31%	307	48%
35 to 44	158	25%	113	18%
45 to 54	96	15%	30	5%
55 to 64	51	8%	5	1%
65 and over	10	2%	5	1%

From the responses to question 3, ‘what do you consider yourself to be?’, it can be seen that the gender distribution was very good and this enhanced the representativeness of the sample. For question 4, ‘what do you consider your Second Life gender to be?’, the avatar gender distribution broadly mirrored the participants gender.

Table 5.2: Responses to survey questions 3 and 4

	Question 3		Question 4	
Answer	Response	Percentage	Response	Percentage
Male	353	56%	316	50%
Female	279	44%	303	48%
Other	4	1%	17	3%

For question 10, ‘have you made purchases of virtual world products in Second Life? (for example clothes for an avatar)’, the results shown below in table 5.3 indicate that the sample had an understanding of the general issues that would be explored in relation to purchasing in SL and specific knowledge on purchasing virtual products. In question 12, ‘have you made purchases of real world products in SL? (for example clothes for your real body)’, the percentage of participant that had purchased real life product in SL was low. This was expected and it is a limitation in relation to the questions that explore the purchase of real life products in SL. This was mitigated by many of the stages between purchasing a real or a virtual product online being the same. An example would be the payment system.

Table 5.3: Responses to survey questions 10 and 12

	Question 10		Question 12	
Answer	Response	Percentage	Response	Percentage
Yes	591	93%	73	11%
No	45	7%	563	89%

The results to questions 5 to 9 are presented in table 5.4. For question 5, ‘how long have you been using Second Life (SL)?’, there was a mean level of experience of 3 years indicating that the participants had a good level of experiences to draw from in relation to the questions. This was a strength of the sample. For question 6, ‘how many hours a month do you spend in Second Life (SL)?’ The mean is the equivalent of two hours a day. This was another indication that participants had a good understanding of the issues being explored in SL. For question 7, ‘how often do you use Second

Life (SL) for Work?’ the participants on average used SL for work for approximately 15% of the time. This was an indication of the level of business activity in SL. For question 8, ‘how often do you use Second Life (SL) for Socialising?’ the participants on average used SL to socialize for approximately half the time. For question 9, ‘how often do you use Second Life (SL) for being creative, buildings, avatars etc.?’ participants on average spent approximately a third of their time being creative.

Table 5.4: Responses to survey question 5 to 9

Answer	Value	Mean	Trimmed Mean, 5%	Median	Standard Deviation	Responses
Q5	0-8	3.24	3.22	3.00	1.71	615
Q6	0-200	64.87	60.90	49.00	56.46	615
Q7	0-100	14.99	11.64	2.00	24.63	615
Q8	0-100	48.39	48.19	49.00	33.01	615
Q9	0-100	34.80	33.11	28.00	30.65	615

The results to questions 11 to 23 are presented in table 5.5. For question 10, ‘have you made purchases of virtual world products in SL? (for example clothes for an avatar)’ the results indicate that the sample had an understanding of the issues that were explored in question 11: ‘Thinking about purchasing virtual products in SL, please tell us how much you agree or disagree with the following statement: For me, purchasing virtual products in SL was a positive experience.’ on average the participants had a positive experience purchasing in SL.

Question 13 asked: ‘thinking about purchasing real products in SL, please tell us how much you agree or disagree with the following statement: For me, purchasing real world products from SL was a positive experience.’ This question had a low response as many participants had not made a purchase of real products. The previous question, 12, asked the participant if they had made a purchase of real life products in SL and 89% responded that they had not. This question was there because it was

expected that the percentage would be low. The response to that question indicated the degree of the limitation for the subsequent question. It is not clear why more than 11% responded to question 13. One possible explanation is that they took the question to be hypothetical. This discrepancy illustrates the benefit of asking question 12 before but it means the results for question 13 are not reliable.

For question 14, 'for me, the brand also existing offline is important' had mean near 0 and a high variation the indication was that there was a broad range of opinions on this question. For question 15, 'for me, the owner of the shop being famous within SL is important', as in the question above it had a mean near 0 and a high variation. For question 16, 'for me, access to a shopping assistant is important.' This question also had a mean near 0 and high variation. In such cases the qualitative data is very useful to assess what the varied and opposing views on the topic are. For this question it was clear from the qualitative analysis that this was a controversial issue with strong opposing views.

For question 17: 'for me, access to the person who created what I am purchasing is important.' This was a popular vignette that was related to the more personal environment of SL. This more personal environment seems to be important in the retail context also. It is a related issue to the social nature of SL. For question 18, 'when buying virtual products I want them to be presented in 3D' the results showed that this was a very popular vignette with a high mean and lower variation. While it seems obvious most products are still presented in 2D even in VW for convenience. A richer environment in a shop in SL cost more to develop and takes longer to load. For question 19, 'getting cheap products is important to me' this was very popular vignette with a high mean. This is an example of an issue that arose from the qualitative data and despite seeming uncontroversial it needed to be assessed for its significance. For example it was useful to know that this was marginally less important than rendering products in 3D. A retailer could raise prices to pay for the cost of rendering.

For question 20, 'I like a shop to be in a popular area' the result showed that this was not important to most participants. This view was held strongly by a small number of participants in the qualitative research but it did not seem to get broader traction. This illustrated an advantage of quantitative

methods over qualitative of not being overly influence by a small number of vociferous participants. For question 21, ‘I like a shop to be near other interesting shops’ was a popular view related to the browsing, navigation and location issues. It is interesting that this is a related issue to the one above but it was far more popular. It could be that despite the social nature of SL a good range in choices of products is still more important. For question 22, ‘I like the store to be busy with many people walking around’, this vignette was on average marginally unpopular but with a high variation. This reinforces the limits to which the sociable aspect of shopping is important. For question 23, ‘when I am shopping I do not like shopping assistants being in there’ the result were on average marginally popular but again with a high variation. This was another issue with strong opposing views in the qualitative analysis.

Table 5.5: Responses to survey question 11 to 23

Answer	Mean	Trimmed Mean, 5%	Median	Standard Deviation	Responses
Q11	25.94	27.23	30.00	19.59	603
Q13	2.07	2.34	0.00	21.57	409
Q14	-3.69	-3.88	0.00	27.05	615
Q15	-2.79	-3.10	0.00	28.82	615
Q16	2.28	2.53	5.00	27.08	615
Q17	17.33	18.93	20.00	24.69	615
Q18	20.90	22.17	21.00	21.37	615
Q19	19.46	21.00	20.00	23.21	615
Q20	2.23	2.52	0.00	23.87	615
Q21	15.96	17.18	20.00	21.54	615
Q22	-4.45	-4.74	0.00	26.88	615
Q23	2.61	2.90	0.00	24.36	615

For questions 24 to 37 the range was -50 to 50. These questions were answered by 613 participants. While descriptive statistics can establish the degree of support for a question they cannot establish whether two issues being compared have significantly different support. Therefore these questions were explored further in section 5.4.

Table 5.6: Responses to survey questions 24 to 37

Answer	Channel	Mean	Trimmed Mean, 5%	Standard Deviation
Q24	Offline	15.93	16.97	23.02
	Online 2D	19.82	21.09	20.81
	Second Life	19.98	21.78	22.88
Q25	Offline	14.20	15.78	27.52
	Online 2D	8.29	9.21	27.76
	Second Life	-8.20	-9.11	30.60
Q26	Offline	20.46	22.69	27.03
	Online 2D	21.13	23.22	24.90
	Second Life	6.65	7.38	28.77
Q27	Offline	18.51	20.60	28.57
	Online 2D	6.84	7.60	28.60
	Second Life	-11.52	-12.65	29.71
Q28	Offline	24.69	27.34	27.00
	Online 2D	21.39	23.71	25.45
	Second Life	6.01	6.68	29.95
Q29	Offline	19.79	21.72	25.07
	Online 2D	26.10	28.11	22.42
	Second Life	9.77	10.85	27.77
Q30	Offline	24.05	26.14	24.09
	Online 2D	23.47	25.35	22.55
	Second Life	8.58	9.55	27.92
Q31	Offline	20.66	22.50	24.84
	Online 2D	17.55	19.23	23.85
	Second Life	6.82	7.58	27.14
Q32	Offline	23.15	25.15	25.03
	Online 2D	24.16	26.14	23.46
	Second Life	11.97	13.31	26.78
Q33	Offline	24.46	27.01	26.64
	Online 2D	7.42	8.25	28.29
	Second Life	-7.39	-8.20	29.56
Q34	Offline	18.54	20.31	25.34
	Online 2D	18.08	19.75	23.45
	Second Life	17.61	19.43	25.96
Q35	Offline	12.52	13.66	24.19
	Online 2D	14.18	15.35	23.16
	Second Life	24.35	26.15	23.81
Q36	Offline	7.93	8.81	24.67
	Online 2D	10.01	11.11	22.73
	Second Life	17.46	19.25	25.74
Q37	Offline	-0.48	-0.53	26.18
	Online 2D	-0.25	-0.13	23.75
	Second Life	6.50	6.95	23.62

For questions 38 to 59 the participants responded to a scale from -50 to 50. The questions compared a potential RA of SL with one of the other two channels.

Table 5.7: Responses to survey questions 38 to 59

Answer	Channel compared to SL	Mean	Trimmed Mean, 5%	Standard Deviation
38	Offline	11.18	12.41	26.42
39	Online 2D	16.06	17.52	25.02
40	Offline	1.18	1.31	26.58
41	Online 2D	10.25	11.33	24.47
42	Offline	16.44	17.91	24.58
43	Online 2D	8.39	9.15	24.97
44	Offline	8.13	9.04	27.65
45	Online 2D	10.03	11.14	26.74
46	Offline	1.01	1.12	27.41
47	Online 2D	6.07	6.72	25.44
48	Offline	2.93	3.29	24.73
49	Online 2D	6.02	6.54	23.71
50	Offline	14.73	16.28	25.00
51	Online 2D	18.52	20.07	23.10
52	Offline	7.75	8.55	24.85
53	Online 2D	8.11	8.98	24.03
54	Offline	22.17	24.08	24.81
55	Online 2D	17.57	19.38	25.69
56	Offline	16.86	18.45	24.83
57	Online 2D	15.93	17.46	18.50
58	Offline	23.49	25.33	23.65
59	Online 2D	23.02	24.73	23.23

Question 60, was an optional open ended question that was useful to have at the end of a survey of closed questions in order to enable the participants to express a view they may have that did not find an outlet in one of the specific questions asked: ‘If you have additional comments about your experience in Second Life, 2D websites and offline that have not been addressed in the survey and you would like to share them, please enter them in the space provided below:’. This qualitative data could have been analyzed in NVivo following a typical qualitative analysis. This would not utilize the strength of the survey however which is the large volume of responses. Therefore the data was coded and quantified as is the preferred approach in these situations (Tashakori and Teddlie, 2002). There were 111 responses, some of which were extensive and covered a number of issues. Many issues were commented on just once or were not relevant so they were not included.

Table 5.8: Themes of the responses to survey question 60

	Theme	Example	Responses (88)	Percentage of all responses
1	I do not have a comment.	n/a , none.	14	16%
2	Positive feedback on survey.	Nice survey;), interesting survey!	7	8%
3	General positive comment.	Cool, thanks for the invite.	7	8%
4	Gave their name.	-	4	5%
5	General suggestions on how to improve SL.	Need free living areas, faster rendering.	5	6%
6	General criticisms of SL.	Change the viewer 2...this is a bad experience, SL is so laggy, speed is an issue...	6	7%
7	General praise of SL.	It's the visuals that make it enjoyable, SL allows you to explore different aspects of oneself that you cannot attempt in real life.	7	8%
8	Positive experience purchasing in SL.	SL shopping for SL is good.	9	10%
9	Negative experience purchasing in SL.	Shopping in SL lacks the 3D component.	10	11%
10	Positive about real products from SL.	...being able to purchase RL items in SL would be a great addition...	4	5%
11	Negative about real products from SL.	I am not interested in, nor would I purchase real-world items on SL.	5	6%
12	Advantages of virtual products.	All the clothing always fits in SL.	7	8%
13	Companies entering SL should adapt better.	RL brands that tried to enter SL failed because they do not put in enough effort.	3	3%

5.4.2 Demographic analysis

5.4.2.1 Analysis by gender

It is a common practice to explore the relationship between gender and other variables in research. In business research this is especially useful as many products are different for men and women. For example a shop that only sold men's clothes would be more interested in the men's opinions. A shop that sold to both sexes, but offered different clothes to each gender would also be interested in any differences.

In order to assess whether there were any differences in the responses between male and female participants they were all compared. This was done using the independent t-test to compare between the mean of the males responses and the mean of the female responses. This analysis identified the differences and indicated their significance. 85 t-tests were implemented. The most significant cases are discussed here in terms of the mean 'M', standard error mean 'SE', the value for the t-statistic, '*t*', the degrees of freedom in brackets the two-tailed significance value of *t*, '*p*' and the effect size '*r*'. This is the most typical way to report the t-test (Field, 2009). Interestingly in these cases the female response is more positive towards SL than the male response. The findings are summarised in table 5.9. A typical value for the significance *p* is 0.05. To limit the risk of type one errors were a true null hypothesis is rejected the significance was set at 0.025. This risk is a limitation of this analysis. The t-test is discussed further in section 5.4.4.

Table 5.9: Gender analysis t-tests

Question	Male mean	Male standard error mean	Female mean	Female standard error mean	t-statistic (605)	P (significance)	R (effect size)
2	3.52	0.08	3.07	0.07	4.02	<0.025	0.16
6	53.40	2.80	71.80	3.50	-4.20	<0.025	0.17
9	31.20	1.58	39.34	1.88	3.40	<0.025	0.13
11	73.84	1.06	81.07	1.17	4.60	<0.025	0.19
43	56.37	1.33	62.61	1.56	-3.05	<0.025	0.12
51	67.67	1.25	73.41	1.28	3.18	<0.025	0.13
54	70.87	1.32	78.19	1.44	-3.74	<0.025	0.15
57	65.34	1.35	71.76	1.46	-3.21	<0.025	0.13

For question 2, ‘what is the age your avatar appears to be in Second Life’, when comparing the male, and female responses, $t(605)=4.02$, $p<0.05$, $r=0.16$, females had younger avatars than men with a significant difference but a small effect size.

For question 6, ‘how many hours a month do you spend in Second Life (SL)?’, when comparing the male, and female response, $t(605)=-4.20$, $p<0.025$, $r=0.17$, females on average spent significantly longer in SL but with a small effect size meaning the effect explains a small amount of the variance. This was the second largest difference in means between the genders responses.

For question 9, ‘how often do you use Second Life (SL) for being creative, buildings, avatars etc.’, when comparing the male, and female response, $t(605)=-3.40$, $p<0.025$, $r=0.13$, females on average spent significantly longer being creative, again however with a small effect size.

For question 11, ‘...for me, purchasing virtual products in SL was a positive experience’, when comparing the male, and female response, $t(605)=4.60$, $p<0.025$, $r=0.19$, females on average had a significantly more positive experience but with a small effect size. This was the largest difference in means between the genders responses.

For question 43, ‘a relative advantage of shopping in SL compared to a 2D navigation website is the convenience and speed’, when comparing the male, and female response, $t(605)=-3.05$, $p<0.025$,

$r=0.12$, females agreed with the RA stated in the question having a significant difference but a small effect size.

For question 51, 'relative advantage of shopping in SL compared to a 2D navigation website is the way you navigate the world as it enhances the browsing experience', when comparing the male and female response, $t(605)=-3.18$, $p<0.025$, $r=0.13$, females agreed with the RA having a significant difference but a small effect size.

For question 54 'relative advantage of shopping in SL compared to offline shopping is that I can become something I am not in real life, reinvent myself', when comparing the male and female response, $t(605)=-3.74$, $p<0.025$, $r=0.15$, females agreed with the relative advantage having a significant difference but a small effect size.

For question 57, 'a relative advantage of shopping in SL compared to a 2D navigation website is that I can purchase virtual versions of real life products at a much lower price', when comparing the male and female response, $t(605)=-3.21$, $p<0.025$, $r=0.13$, females agreed with the RA having a significant difference but again as in the other cases in this section a small effect size.

5.4.2.2 Analysis by age

Age, like gender, is a category by which participant responses are analysed. Whether age is collected as a continuous variable or categorical as in this research it is usually necessary to have the data in categorical form for it to be analysed and presented in a useful way. In this research data on age was collected in seven categories as seen in section 3 of this chapter. In business research identifying the difference in responses by different age groups is useful for many reasons. An example is that a retailer that sells products related to parenting may not choose a channel that is only popular with ages 65 and above.

Since there were seven categories, or groups, that would be compared the one-way ANOVA was used. The specific process chosen was selecting 'analyse', 'compare means' and 'one-way ANOVA'. Lastly 'Scheffe' was selected from the 'post-hoc' options. There were 3 significant differences in responses depending on age. This is a relatively small number given the amount of comparisons made. This is an indication that age did not play a significant role in the responses. This could be caused by the choice of sample. The participants were required to be members of SL. This is an indication that they were reasonably technology savvy. If the sample had been taken without this requirement it is possible that the age would have played a greater role.

For question 28 the third variable SL, 'I would feel confident purchasing a book through this channel', there was a significant difference between the group 18 to 24 and three age groups, 25 to 34, $F(6,601)=5.57$, (MD=-13.67, SE=3.58), $p<0.05$, 35 to 44 (MD=-19.23, SE=3.73), $p<0.05$ and 45 to 54 (MD=-15.60, SE=4.24), $p<0.025$. The data indicates that on average the age group 18 to 24 was more confident purchasing a book from SL than the age groups 25 to 54. The other two groups in this question did not have a significant difference.

5.4.2.3 Analysis by experience

From the descriptive statistics carried out alongside ANOVA one interesting result was that most participants had three or four years of experience, over 200 for each. For the eight years of potential experience the distribution starting from one year was 10, 49, 88, 202, 214, 36, 9, 3, 4. For four of the age groups the sample is very small and makes them a less reliable indication of the population.

In relation to purchases an area where one could have expected experience to play a role it did not. They were remarkably consistent across the levels of experience. For question 6, 'how many hours a month do you spend in Second Life (SL)?', an area where one could expect age to have an impact it

had. Apart from years 3 to 4 and 7 to 8 in all the other cases an additional year of experience had a higher mean of hours spent per week as can be seen in graph 5.1:

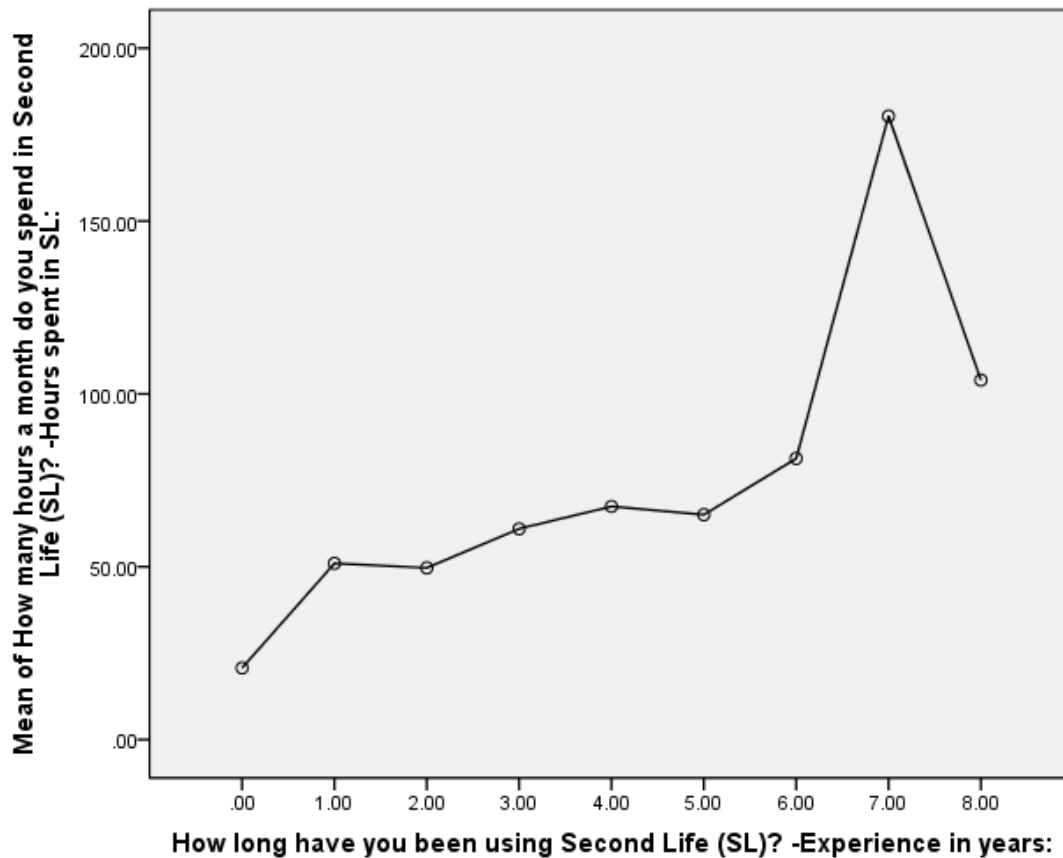


Diagram 5.1: Experience in SL compared hours spent per month

These differences were found to be significant, $F(8, 606)=4.13$, ($M=20.7, 50.98, 49.69, 60.96, 67.44, 65.06, 81.33, 180.33, 104.00$), ($SE=9.60, 7.54, 5.61, 3.87, 3.74, 7.66, 17.40, 15.39, 42.62$), $p<0.05$, one-tailed. There are at least two plausible explanations for this. The first, the more experience one has the more things they find to do and hence they spend more time. The second, as years go by casual, less committed users are lost and only the more avid, committed, users stay.

5.4.3 Cluster analysis

5.4.3.1 Introduction

The cluster analysis is a collection of statistical methods that attempt to identify groups of individuals with similar beliefs or demographics that are different to other groups. This analysis was used to explore relationships that had been indicated in previous stages and others where there were no indications. It therefore supplemented the targeted t-test analysis that was grounded in the qualitative analysis. The broad analysis gave the opportunity to identify useful relationships that were not expected. This combination of targeted and broader analysis was also implemented in the qualitative analysis.

The three most popular methods of clustering are hierarchical, k-means and two-step. The size and nature of the set influences the cluster analysis. Hierarchical clustering is usually used for small datasets that will produce a small number of clusters. This is because the clustering process involves creating a matrix of distances between all pairs of case. K-means is used when a specific number of clusters are sought. Various combinations of cases are tested to achieve the optimum groupings. Lastly, for large datasets with a mixture of continuous and categorical data the two-step clustering is usually preferred (Nurusi, 2010). This method analyses the data just once making it much faster and able to handle large data sets. The criteria for the clustering can also be a combination of continuous and categorical data. While the methods accuracy is optimised when variables are either continuous and normal or categorical and multinomial the method delivers useful results even when these criteria are not met (Nurusi, 2010). The two-step cluster method was chosen to analyse the data set in PASW Modeller 13. For the two-step method a one way ANOVA was used to compare the means of the clusters. The more robust methods of Welch and Brown Forsythe were also used and had similar results. The two-step cluster analysis implemented covers the three following sections. A combination of hierarchical and k-means is discussed in the penultimate section followed by the conclusion.

5.4.3.2 Two-step cluster analysis using demographic information

The first cluster analysis implemented analysed all the questions of the survey however the cluster quality was very poor with a measure of cohesion and separation of 0.0. A second attempt analysed all the responses to section one but the level of cohesion and separation was also 0.0. The next analysis involved taking the demographic information of age, gender, years of experience and hours of use and the information from the questions of section 2. The level of cohesion and separation was low at 0.2 and importantly the demographic cases had minimal significance in the cluster formation. The same demographic information was used with the addition of the responses of section 3. The level of cohesion and separation was low at 0.2 and again the demographic cases had minimal significance in the cluster formation. Other attempts were made comparing the demographic data to the responses related to one channel at a time but the results again had low cohesion and separation below 0.1. More targeted analysis was then implemented using the same demographic information and one specific question at a time. The measure of cohesion and separation was always low below 0.1.

5.4.3.3 Two-step cluster analysis of section 2

The first cluster analysis related to the responses to section 2 took all the responses from questions 24 to 37 and looked for clusters. Two clusters were identified however the measure of cohesion and separation was low at 0.2. The one way ANOVA found a $F=48.08$, $p<0.25$. The first cluster represented 43.9% of the participants and for most questions had, on average, a positive response to the questions. The second cluster had a mostly normal distribution around the neutral response to the question and represented 56.1% of the participants. The predictive decision tree in PASW Modeller identified the responses to question 32, 28, 34 as the most important to the formation of the clusters in that order. The vignette for question 32 stated that the consumer would purchase simple products like a book from the three channels. Questions 28 and 34 were about confidence in purchasing simple products and shopping for enjoyment. While the measure of cohesion and separation was low there was a significant difference in the means. The box graphs and diagrams of the clusters absolute

distributions showed that there was significant overlap in the clusters. The mean of the first cluster was significantly positive. The second cluster was mostly neutral and to a lesser extent negative. This suggests that there was one cluster with a degree of cohesion where the participants on average had a positive view and one weak cluster with high variance that represents the rest of the participants. If this is related to the most significant questions there seemed to be a cluster that were more positive about shopping in relation to most issues.

A second approach to the cluster analysis for section two of the survey was to explore the responses to each channel separately. As all the questions of this section required a response for each of the three retail channels so it would be useful to explore whether a cluster of participants always preferred one channel. The first analysis was on the responses to offline retail. Two clusters were identified but they had a low measure of cohesion of 0.2. The one way ANOVA found a $F=43.23$, $p<0.25$. The first cluster of 51.2% on average had responses positive to offline retail and the second cluster of 48.8% had responses that were normally distributed on the neutral response. The most important questions in the formation of the clusters were 26, 28, 30, 33. The most significant questions were 26 and 28 and they were related to the convenience and confidence related to purchasing a book from a channel.

The second analysis was on the responses to 2D navigation websites. Two clusters were found again with a poor measure of cohesion and separation of 0.2. The result of the one way ANOVA was $F=44.50$, $p<0.25$. The first cluster represented 39.6% of the participants and included mostly positive responses. The second cluster represented 60.4% of the responses and it was normally distributed on the centre of the scale. The predictive decision tree showed that questions 24, 27, 28, 30, 32 were important in the formation of the clusters. Question 24 asked whether the participant felt they would learn everything they wanted about the product from this channel. This was a question where 2D navigation websites had an advantage in both the qualitative and quantitative analysis and it is therefore logical that this question would be significant for the cluster formation in relation to this channel.

The third and final analysis of this type was for the responses to the questions on SL. Here the two-step cluster analysis found three clusters but the measure of cohesion and separation was again poor at 0.1. The one way ANOVA was significant for the linear term $F=24.97$, $p<0.25$, but not for the quadratic term, $F<1$, $p>0.25$. The first cluster that represented 44.4% of responses was mostly positive, the second cluster of 41.3% was mostly normally distributed on the middle point and the third of 14.3% was mostly negative. The predictive decision tree showed that the most significant questions in the formation were 29, 34 and 28. Question 29 asked whether participants thought the channel in question was good at determining what product to purchase. The existence of the cluster of mostly negative responses was only present in relation to SL as it did not exist in relation to the other two channels. This is an indication that there was a cluster of participants that generally preferred offline and 2D navigation websites to SL.

5.4.3.4 Two-step cluster analysis of section 3

The responses to the third section were explored for possible clusters. The first advantage of this was that all these questions followed the same format and logic. They all asked whether a certain issue was an advantage in SL. It was therefore useful to explore if there were clusters in the responses. The two-step cluster analysis found three clusters. The first cluster included participants that mostly responded negatively or neutrally, 35.8. The second cluster comprised of participants that responded on average neutrally, 33.0%. The third cluster comprised of participants that responded mostly positively, 31.2%. The measure of cohesion and separation however was poor at 0.1. The one way ANOVA was significant for the linear term $F=40.10$, $p<0.25$, but not for the quadratic term, $F<1$, $p>0.25$. Therefore their means were significantly different. The low measure of cohesion and separation of the cluster in combination with the significant difference of the means did not give a clear conclusion on the importance of the clusters. Therefore the clusters were further explored with a box graph and diagrams of the absolute cluster distribution. The four methods in combination indicate that the third cluster has smaller variance while the first and second clusters have a very broad variance and is weak. Therefore the third cluster is worthy of further analysis and discussion.

When the results were modelled with the predictive decision tree of PASW Modeller it was found that questions 57, 45, 47, 50, 38, 42, 72, 52, 39 had a significant influence on the cluster formation but the other questions did not. They are listed in order of significance. Question 57 was by far the most significant. The vignette for question 57 stated that a RA of SL compared to a 2D navigation website was that you could purchase virtual versions of real life products at a much lower price. This question is very directly related to purchasing. One possible explanation for the significance of this case to the cluster formation is that the participants that responded positively to this question were in general more positive about purchasing in SL and hence more positive in relation to most questions. The second most significant case in the cluster formation was question 45. This question stated that the payment method in SL was easier than 2D navigation websites. As with the previous question this is very specifically about purchasing.

5.4.3.5 Hierarchical and K-means cluster analysis of sections 2 and 3

Because of the failure of the two-step clustering to identify clusters with a fair or good measure of cohesion and separation an additional attempt was made with a different method. The hierarchical and k-means were rejected because of the weaknesses discussed in the introduction to this chapter. An additional drawback of hierarchical clustering not mentioned is that it cannot support different clusters with similar expression patterns. The k-means weakness is that a predefined number of clusters are required as a starting point. The two methods are often used in combination to mitigate their weaknesses.

This approach implements the hierarchical analysis first and then uses the number of clusters and locations as the starting point for the k-means analysis. The data used were the responses to section one and two as they used the same scales and did not have categorical data. The hierarchical analysis did not present any obvious clusters in line with the two-step analysis. Seven clusters were chosen.

The k-means analysis gave these clusters a poor measure of cohesion and separation of 0.2. These results were not an improvement on the two-step analysis.

5.4.3.6 Conclusion

The extensive cluster analysis did not identify any significant clusters related to the four demographic characteristics. When comparing section two as a whole or by channel two clusters emerged with a weak measure of cohesion and separation. The first cluster was mostly positive and the second mostly negative. When analysing the responses related to each channel separately the responses to SL also had a cluster that was mostly negative. A mostly negative cluster did not exist for the other two channels.

For section three, three clusters emerged, one mostly neutral and partly negative, one neutral and a smaller one mostly positive. Once again however the degree of cohesion and separation was poor. The mostly positive cluster was characterised by positive responses to the more specific questions related to purchasing. It could be suggested therefore that if someone is positive specifically about purchases in SL they are more likely to be positive about all the aspects related to SL. If this is expressed in a different way it offers a more useful insight: For someone to be positive specifically about purchasing they have to also be positive about everything else. Despite the interesting clusters of participants there were none with a fair, or good level of cohesion and separation.

5.4.4 Channel comparison on key variables

5.4.4.1 Introduction

The choice of which quantitative method to use was based on what the objectives and the data were. One objective, in terms of analysis method was hypotheses testing that ruled out all the analysis methods not suited for that. Since the data was neither nominal, nor ordinal methods such as Chi-square, K-S, Runs, Binomial, Mann-Whitney, Median, Sign, Wilcoxon and McNamara were ruled out (Malhotra, 1999). As the data was interval or better the options were the t-test and z-test. Since there were paired samples the z-test was rejected leaving the t-test (Malhotra, 1999). The t-test also enabled comparing between variables.

The t-test involves comparing the means of two groups independent variable in order to assess whether they are sufficiently different that they can be considered to be from different populations (Black, 1999). There are two categories of t-tests, the independent-means t-test where different populations are used and the dependent-means t-test where the same participants are used (Field, 2009). The later applies to this thesis. There is the one sample t-test assessing whether a sample is part of a known sample or an unknown one and the two sample test that compares two samples to assess whether they are part of the same population for a given trait. This research uses the one sample t-test comparing the sample to the null hypothesis for the questions that have one scale, and the two sample test of those that have three scales for the same question. When channels are compared between themselves in relation to an issue the analysis proves whether the channels are perceived differently or not, in relation to that issue.

The first step to applying the t-test is to establish a null hypothesis for each question. The t-test either proves the null hypothesis and thus rejects the alternative hypothesis or disproves the null hypothesis and proves the alternative hypothesis. When comparing between two sets of data the typical null

hypothesis is that there is no difference between them. A probability, p-value, is typically set at 0.05. If the outcome of the t-test is higher than 0.05 then the null hypothesis is supported and it is considered that the two sets are statistically the same. In order to limit the risk of type 1 errors the p-value for this thesis was set at 0.025. When multiple t-tests are used together the risk of type one errors increases. The analysis in this chapter implements the t-tests separately comparing two channels. If the t-tests in this section were combined to create an order of preference for all three channels the risk of type one errors would increase.

The implementation of the t-test can be done by solving the formula or by using existing functions in SPSS, Microsoft Excel or similar worksheet programs. In this thesis SPSS was used as it had sufficient functionality for all the analysis implemented. Within SPSS the process followed was to select 'analyse', then 'compare means' and then 'paired sample t-test'. As the participants chose with a slider from -50 to 50, 51 was added to all the results of this type to ensure that there were no 0 or negative values.

The two sample paired t-test was applied to questions 24 to 37. The one sample t-test was applied to questions 38 to 59. The analysis provides a number of findings beyond the t-test value. The key results of the t-test are discussed in the next two sections.

5.4.4.2 Analysis of questions comparing three channels

A summary table of the results of this section is provided on the following page. The first question for which the two sample dependent t-test was applied was question 24. For question 24 the vignette stated: 'I would learn all I need to know about a product from this channel', when comparing offline (M=66.46, SE=0.97) to online 2D (M=71.18, SE=0.85), $t(607)=-4.49$, $p<0.025$, $r=0.18$, participants on average considered the latter to be preferable out of the two to a significant degree. When comparing offline to SL (M=70.84, SE=0.93) $t(607)=-3.52$, $p<0.025$, $r=0.14$, participants on average

considered the latter to be significantly preferable. When comparing online 2D to SL, $t(607)=0.34$, $p>0.025$, $r=0.01$, participants on average considered the former to be preferable. All three however had a very small effect size accounting for less than 1% of total variance.

For question 25, 'I would find it convenient to purchase car insurance from this channel ', when comparing offline ($M=65.76$, $SE=1.14$) to online 2D ($M=58.87$, $SE=1.17$), $t(607)=4.89$, $p<0.025$, $r=0.19$, participants on average considered the former to be significantly preferable. When comparing offline to SL, ($M=40.30$, $SE=1.23$), $t(607)=15.17$, $p<0.025$, $r=0.52$, participants on average considered the former to be significantly preferable. When comparing online 2D to SL, $t(607)=14.90$, $p<0.025$, $r=0.52$, participants on average considered the former to be significantly preferable. The last two had a large effect size accounting for around 25% of variance.

For question 26, 'I would find it convenient to purchase a book from this channel', when comparing offline ($M=73.87$, $SE=1.04$) to online 2D ($M=74.70$, $SE=0.98$), $t(607)=-0.96$, $p>0.025$, $r=0.04$, participants on average considered the latter be preferable. When comparing offline to SL ($M=57.82$, $SE=1.18$), $t(607)=11.84$, $p<0.025$, $r=0.43$, participants on average considered the former be significantly preferable. When comparing online 2D to SL, $t(607)=13.72$, $p<0.025$, $r=0.49$, participants on average considered the former to be significantly preferable. The last two had a large effect size.

Table 5.10A: Summary of analysis of section 2 of the survey 1/3

	Question	Comparing offline to online 2D							Comparing offline to SL					Comparing online 2D to SL		
		Offline		Online 2D					SL							
		M	SE	M	SE	t(607)	p	r	M	SE	t(607)	p	r	t(607)	p	r
24	I would learn all I need to know about a product from this channel	66.46	0.97	71.18	0.85	-4.49	<0.025	0.18	70.84	0.93	-3.52	<0.025	0.14	0.34	>0.025	0.01
25	I would find it convenient to purchase car insurance from this channel	65.76	1.14	58.87	1.17	4.89	<0.025	0.19	40.30	1.23	15.17	<0.025	0.52	14.90	<0.025	0.52
26	I would find it convenient to purchase a book from this channel	73.87	1.04	74.70	0.98	-0.96	>0.025	0.04	57.82	1.18	11.84	<0.025	0.43	13.72	<0.025	0.49
27	I would feel confident purchasing the car insurance policy through this channel	71.42	1.15	57.18	1.20	11.04	<0.025	0.41	37.36	1.21	20.57	<0.025	0.64	15.99	<0.025	0.54
28	I would feel confident purchasing a book through this channel	78.80	1.04	75.13	1.01	4.62	<0.025	0.18	57.35	1.24	15.39	<0.025	0.53	14.42	<0.025	0.51
29	To determine what I want to buy I like using this channel	72.17	0.98	78.43	0.90	-6.92	<0.025	0.27	60.11	1.13	8.53	<0.025	0.33	14.03	<0.025	0.49

Table 5.10B: Summary of analysis of section 2 of the survey 2/3

	Question	comparing offline to online 2D							comparing offline to SL					comparing online 2D to SL		
		offline		online 2D					SL							
		M	SE	M	SE	t(607)	p	r	M	SE	t(607)	p	r	t(607)	p	r
30	To purchase a product I like using this channel	76.63	0.95	75.81	0.92	0.91	>0.025	0.04	59.27	1.11	12.23	<0.025	0.44	13.14	<0.025	0.47
31	For after sales service I like using this channel	72.74	1.01	68.87	0.98	3.25	<0.025	0.13	57.25	1.11	10.14	<0.025	0.38	9.06	<0.025	0.35
32	For a simple product that is always the same and does not involve contracts and negotiation such as a book I would use this channel	75.93	0.99	77.21	0.96	-1.44	>0.025	0.06	63.09	1.11	9.41	<0.025	0.36	12.47	<0.025	0.45
33	For a complex product that is not always the same and may need negotiation such as car insurance, I would prefer this channel	77.10	1.07	57.57	1.15	13.72	<0.025	0.49	41.71	1.19	20.68	<0.025	0.64	12.90	<0.025	0.46

Table 5.10C: Summary of analysis of section 2 of the survey 3/3

	Question	comparing offline to online 2D							comparing offline to SL					comparing online 2D to SL		
		offline		online 2D					SL							
		M	SE	M	SE	t(607)	p	r	M	SE	t(607)	p	r	t(607)	p	r
34	I enjoy shopping on this channel for its own sake, not just for the items I may have purchased	70.25	1.01	69.85	0.96	0.41	>0.025	0.02	69.85	1.05	0.75	>0.025	0.03	0.52	>0.025	0.02
35	This channel doesn't just sell products-it entertains me	62.17	1.02	64.88	0.96	-2.85	<0.025	0.11	76.61	0.97	-11.87	<0.025	0.43	-11.05	<0.025	0.41
36	Shopping from this channel "gets me away from it all"	58.10	1.00	61.00	0.93	-2.71	<0.025	0.11	69.50	1.05	-9.35	<0.025	0.35	-8.49	<0.025	0.33
37	I find this channel is not as good as other channels at informing me about the product	50.80	1.06	48.79	1.01	1.80	>0.025	0.07	56.82	0.99	-4.21	<0.025	0.17	-6.67	<0.025	0.26

For question 27, 'I would feel confident purchasing the car insurance policy through this channel', when comparing offline ($M=71.42$, $SE=1.15$) to online 2D ($M=57.18$, $SE=1.20$), $t(607)=11.04$, $p<0.025$, $r=0.41$, participants on average considered the former to be significantly preferable. When comparing offline to SL ($M=37.36$, $SE=1.21$), $t(607)=20.57$, $p<0.025$, $r=0.64$, participants on average considered the former to be significantly preferable. When comparing online 2D to SL, $t(607)=15.99$, $p<0.025$, $r=0.54$, participants on average considered the former to be significantly preferable. All three had a large effect size.

For question 28, 'I would feel confident purchasing a book through this channel', when comparing offline ($M=78.80$, $SE=1.04$) to online 2D ($M=75.13$, $SE=1.01$), $t(607)=4.62$, $p<0.025$, $r=0.18$, participants on average considered the former to be significantly preferable. When comparing offline to SL ($M=57.35$, $SE=1.24$), $t(607)=15.39$, $p<0.025$, $r=0.53$, participants on average considered the former to be significantly preferable. When comparing online 2D to SL, $t(607)=14.42$, $p<0.025$, $r=0.51$, participants on average considered the former to be significantly preferable. The last two also had a large effect size. These results give confidence in the accuracy of the results as simple products such as books were one of the first to be successfully sold online. These results show they are more popular than the complex products discussed above.

For question 29, 'to determine what I want to buy I like using this channel', when comparing offline ($M=72.17$, $SE=0.98$) to online 2D ($M=78.43$, $SE=0.90$), $t(607)=-6.92$, $p<0.025$, $r=0.27$, participants on average considered the latter to be significantly preferable. When comparing offline to SL ($M=60.11$, $SE=1.13$), $t(607)=8.53$, $p<0.025$, $r=0.33$, participants on average considered the former to be significantly preferable. When comparing online 2D to SL, $t(607)=14.03$, $p<0.025$, $r=0.49$, participants on average considered the former to be significantly preferable. The first two cases had a medium effect size and the latter had a large effect size.

For question 30, 'to purchase a product I like using this channel', when comparing offline ($M=76.63$, $SE=0.95$) to online 2D ($M=75.81$, $SE=0.92$), $t(607)=0.91$, $p>0.025$, $r=0.04$, participants on average

considered the former to be preferable. When comparing offline to SL ($M=59.27$, $SE=1.11$), $t(607)=12.23$, $p<0.025$, $r=0.44$, participants on average considered the former to be significantly preferable. When comparing online 2D to SL, $t(607)=13.14$, $p<0.025$, $r=0.47$, participants on average considered the former to be significantly preferable. The last two cases had a large effect size.

For question 31, ‘for after sales service I like using this channel’, when comparing offline ($M=72.74$, $SE=1.01$) to online 2D ($M=68.87$, $SE=0.98$), $t(607)=3.25$, $p<0.025$, $r=0.13$, participants on average considered the former to be preferable. When comparing offline to SL ($M=57.25$, $SE=1.11$), $t(607)=10.14$, $p<0.025$, $r=0.38$, participants on average considered the former to be significantly preferable. When comparing online 2D to SL, $t(607)=9.06$, $p<0.025$, $r=0.35$, participants on average considered the former to be significantly preferable. The last two had a medium effect size.

For question 32, ‘for a simple product that is always the same and does not involve contracts and negotiation such as a book I would use this channel’, when comparing offline ($M=75.93$, $SE=0.99$) to online 2D ($M=77.21$, $SE=0.96$), $t(607)=-1.44$, $p>0.025$, $r=0.06$, participants on average considered the latter to be preferable but this was not significant. When comparing offline to SL ($M=63.09$, $SE=1.11$), $t(607)=9.41$, $p<0.025$, $r=0.36$, participants on average considered the former to be significantly preferable. When comparing online 2D to SL, $t(607)=12.47$, $p<0.025$, $r=0.45$, participants on average considered the former to be significantly preferable. For this question there was an increase of effect size starting from low, then medium and then high.

For question 33, ‘for a complex product that is not always the same and may need negotiation such as car insurance, I would prefer this channel’, when comparing offline ($M=77.10$, $SE=1.07$) to online 2D ($M=57.57$, $SE=1.15$), $t(607)=13.72$, $p<0.025$, $r=0.49$, participants on average considered the former to be significantly preferable. When comparing offline to SL ($M=41.71$, $SE=1.19$), $t(607)=20.68$, $p<0.025$, $r=0.64$, participants on average considered the former to be significantly preferable. When comparing online 2D to SL, $t(607)=12.90$, $p<0.025$, $r=0.46$, participants on average considered the former to be significantly preferable. All three had a large effect size. This question was similar to

question 27 and the results were also very similar indicating that the survey participants were reliable and attentive.

For question 34, 'I enjoy shopping on this channel for its own sake, not just for the items I may have purchased', when comparing offline ($M=70.25$, $SE=1.01$) to online 2D ($M=69.85$, $SE=0.96$), $t(607)=0.41$, $p>0.025$, $r=0.02$, participants on average considered the former to be preferable but this was not significant. When comparing offline to SL ($M=69.85$, $SE=1.05$), $t(607)=0.75$, $p>0.025$, $r=0.03$, participants on average considered the former to be preferable but this was also not significant. When comparing online 2D to SL, $t(607)=0.52$, $p>0.025$, $r=0.02$, participants on average considered them to be of similar preference and not significantly different like the previous two sections of this question. All three had an insignificant effect size explaining far less than 1% of total variance. The average of the results was very high indicating that participant considered all channels to offer significant enjoyment value. The variance was also high indicating that despite the averages being the same there was a wide range of opinions.

For question 35, 'this channel doesn't just sell products-it entertains me', when comparing offline, ($M=62.17$, $SE=1.02$) to online 2D ($M=64.88$, $SE=0.96$), $t(607)=-2.85$, $p<0.025$, $r=0.11$, participants on average considered the latter to be preferable. When comparing offline to SL ($M=76.61$, $SE=0.97$), $t(607)=-11.87$, $p<0.025$, $r=0.43$, participants on average considered the latter to be significantly preferable. When comparing online 2D to SL, $t(607)=-11.05$, $p<0.025$, $r=0.41$, participants on average considered the latter to be significantly preferable. The last two comparisons had a large effect size.

For question 36, 'shopping from this channel "gets me away from it all"', when comparing offline ($M=58.10$, $SE=1.00$) to online 2D, ($M=61.00$, $SE=0.93$), $t(607)=-2.71$, $p<0.025$, $r=0.11$, participants on average considered the latter to be preferable. When comparing offline to SL ($M=69.50$, $SE=1.05$), $t(607)=-9.35$, $p<0.025$, $r=0.35$, participants on average considered the latter to be significantly preferable. When comparing online 2D to SL, $t(607)=-8.49$, $p<0.025$, $r=0.33$, participants on average considered the latter be significantly preferable. The last two comparisons had a large effect size.

For question 37, ‘I find this channel is not as good as other channels at informing me about the product’, when comparing offline ($M=50.80$, $SE=1.06$) to online 2D ($M=48.79$, $SE=1.01$), $t(607)=1.80$, $p>0.025$, $r=0.07$, two-tailed significance= 0.072 , participants on average considered the former to be preferable but not significantly. When comparing offline to SL ($M=56.82$, $SE=0.99$), $t(607)=-4.21$, $p<0.025$, $r=0.17$, participants on average considered the latter to be significantly preferable. When comparing online 2D to SL, $t(607)=-6.67$, $p<0.025$, $r=0.26$, participants on average considered the latter to be significantly preferable. The last case had a medium effect size.

5.4.4.3 Analysis of questions comparing two channels

Questions 38 to 59 also discussed RA like the ones above. Each question only covered two channels. The next question will be used as an example to illustrate this: Question 38, ‘A relative advantage of shopping in SL compared to offline shopping is that I can do it with my friends so it is more sociable’. If the average response was at ‘neither’ this would indicate that there was no difference in the perception of the two channels. A positive average would indicate a preference to SL. The results are summarized in table 5.10 and discussed further on.

Table 5.11: Comparison of SL to the other channels using t-test analysis

Question	Compared to SL	Mean	Standard error mean	t-statistic	P (significance)	R (effect size)
38	offline	61.19	1.08	9.44	<0.025	0.36
39	2D web	66.80	1.01	15.55	<0.025	0.53
40	offline	50.67	1.08	-0.31	>0.025	0.01
41	2D web	60.38	1.02	9.21	<0.025	0.35
42	offline	69.03	0.95	19.10	<0.025	0.61
43	2D web	59.02	1.02	7.85	<0.025	0.30
44	offline	58.68	1.15	6.68	<0.025	0.26
45	2D web	59.97	1.09	8.20	<0.025	0.32
46	offline	50.17	1.13	-7.31	>0.025	0.03
47	2D web	56.06	1.05	4.81	<0.025	0.19
48	offline	52.91	1.01	1.90	>0.025	0.08
49	2D web	56.79	0.94	6.16	<0.025	0.24
50	offline	66.08	1.00	15.15	<0.025	0.52
51	2D web	70.10	0.91	21.00	<0.025	0.65
52	offline	59.16	1.02	8.00	<0.025	0.31
53	2D web	57.58	1.01	6.53	<0.025	0.26
54	offline	74.00	0.99	23.29	<0.025	0.69
55	2D web	69.21	1.05	17.35	<0.025	0.58
56	offline	68.13	1.01	17.05	<0.025	0.57
57	2D web	66.55	1.00	15.59	<0.025	0.54
58	offline	75.68	0.95	26.00	<0.025	0.73
59	2D web	75.55	0.92	26.60	<0.025	0.73

For question 38, question 37 in the dataset, ‘a relative advantage of shopping in SL compared to offline shopping is that I can do it with my friends so it is more sociable’, when comparing SL, $t(605)=9.44$, $p<0.025$, $r=0.36$, participants on average considered it to be significantly preferable with a medium effect size.

For question 39, ‘a relative advantage of shopping in SL compared to a 2D navigation website is that I can do it with my friends so it is more sociable’, when comparing SL, $t(605)=15.55$, $p<0.025$, $r=0.53$, participants on average considered it to be significantly preferable with a large effect size.

For question 40, ‘a relative advantage of shopping in SL compared to offline shopping is that there is a shop assistant and you can talk to them ‘face to face’’, when comparing SL, $t(605)=-0.31$, $p>0.025$, $r=0.01$, participants on average considered it to be equal with no significant difference.

For question 41, ‘a relative advantage of shopping in SL compared to a 2D navigation website is that there is a shop assistant and you can talk to them ‘face to face’’, when comparing SL, $t(605)=9.21$, $p<0.025$, $r=0.35$, participants on average considered it to be significantly preferable with an average effect size.

For question 42, ‘a relative advantage of shopping in SL compared to offline shopping is the convenience and speed’, when comparing SL, $t(605)=19.10$, $p<0.025$, $r=0.61$, participants on average considered it to be significantly preferable with a very large effect size. One of the largest found in this research.

For question 43, ‘a relative advantage of shopping in SL compared to a 2D navigation website is the convenience and speed’, when comparing SL, $t(605)=7.85$, $p<0.025$, $r=0.30$, participants on average considered it to be significantly preferable with a medium effect size.

For question 44, ‘a relative advantage of shopping in SL is the payment method which is easy to use compared to offline shopping’, when comparing SL, $t(605)=6.68$, $p<0.025$, $r=0.26$, participants on average considered it to be significantly preferable with a medium effect size.

For question 45, ‘a relative advantage of shopping in SL is the payment method which is easy to use compared to a 2D navigation website’, when comparing SL, $t(605)=8.20$, $p<0.025$, $r=0.32$, participants on average considered it to be significantly preferable with a medium effect size.

For question 46, ‘a relative advantage of shopping in SL is the payment method which is safe compared to offline shopping’, when comparing SL, $t(605)=-7.31$, $p>0.025$, $r=0.03$, participants on average had no preference with both channels equally matched. The variance was still high however indicating that even on this issue where the channels were evenly matched many participants had preferences between them.

For question 47, ‘a relative advantage of shopping in SL is the payment method which is safe compared to a 2D navigation website’, when comparing SL, $t(605)=4.81$, $p<0.025$, $r=0.19$, participants on average considered it to be significantly preferable with a low effect size.

For question 48, ‘a relative advantage of shopping in SL is the after sales service which is good compared to offline shopping’, when comparing SL, $t(605)=1.90$, $p>0.025$, $r=0.08$, two-tailed significance 0.059, participants on average considered it to be marginally preferable and not significantly different.

For question 49, ‘a relative advantage of shopping in SL is the after sales service which is good compared to a 2D navigation website’, when comparing SL, $t(605)=6.16$, $p<0.025$, $r=0.24$, participants on average considered it to be significantly preferable with a medium effect size.

For question 50, ‘a relative advantage of shopping in SL compared to offline shopping is the way you navigate the world as it enhances the browsing experience’, when comparing SL, $t(605)=15.15$, $p<0.025$, $r=0.52$, participants on average considered it to be significantly preferable with a large effect size.

For question 51, ‘a relative advantage of shopping in SL compared to a 2D navigation website is the way you navigate the world as it enhances the browsing experience’, when comparing SL, $t(605)=21.00$, $p<0.025$, $r=0.65$, participants on average considered it to be significantly more preferable with a very large effect size.

For question 52, ‘a relative advantage of shopping in SL compared to offline shopping is that good stores are located near each other’, when comparing SL, $t(605)=8.00$, $p<0.025$, $r=0.31$, participants on average considered it to be significantly preferable with a medium effect size.

For question 53, ‘a relative advantage of shopping in SL compared to a 2D navigation website is that good stores are located near each other’, when comparing SL, $t(605)=6.53$, $p<0.025$, $r=0.26$, participants on average considered it to be significantly preferable with a medium effect size.

For question 54, ‘a relative advantage of shopping in SL compared to offline shopping is that I can become something I am not in real life, reinvent myself’, when comparing SL, $t(605)=23.29$, $p<0.025$, $r=0.69$, participants on average considered it to be significantly more preferable with the second largest effect size found in this research.

For question 55, ‘a relative advantage of shopping in SL compared to a 2D navigation website is that I can become something I am not in real life, reinvent myself’, when comparing SL, $t(605)=17.35$, $p<0.025$, $r=0.58$, participants on average considered it to be significantly more preferable with a large effect size.

For question 56, ‘a relative advantage of shopping in SL compared to offline shopping is that I can purchase virtual versions of real life products at a much lower price’, when comparing SL, $t(605)=17.05$, $p<0.025$, $r=0.57$, participants on average considered it to be significantly more preferable with a large effect size.

For question 57, ‘a relative advantage of shopping in SL compared to a 2D navigation website is that I can purchase virtual versions of real life products at a much lower price’, when comparing SL, $t(605)=15.59$, $p<0.025$, $r=0.54$, participants on average considered it to be significantly more preferable with a large effect size.

For question 58, ‘a relative advantage of shopping in SL compared to offline shopping is that I can purchase virtual product that are instantly delivered’, when comparing SL, $t(605)=26.00$, $p<0.025$,

$r=0.73$, participants on average considered it to be significantly preferable with the joint largest effect size found in this research.

For question 59, ‘a relative advantage of shopping in SL compared to a 2D navigation website is that I can purchase virtual product that are instantly delivered’, when comparing SL, $t(605)=26.60$, $p<0.025$, $r=0.73$, participants on average considered it to be significantly and substantially more preferable with the joint largest effect size found in this research.

5.5 Conclusion

The results of the quantitative research were useful in many ways. Overall the combination of various quantitative methods gave a deeper understanding of multichannel retail. Applying the methodology of comparative case study analysis the channels were compared between each other on the variables identified in the qualitative analysis that preceded. Demographic analysis was also implemented and it rendered some useful insights. The results of the analysis presented in this chapter were already a small selected subset of all the findings. There were analyses that produced hundreds of pages of results on their own. The conclusion of this chapter is therefore limited to the key findings and does not attempt to summarize them all. Relating the quantitative findings to the qualitative findings and the five objectives will be covered in the following chapter.

In terms of the demographic analysis in the form of gender females were more positive on a number of issues. Females spent longer in SL, they spent more time being creative, had a more positive experience of virtual products, considered SL more convenient than 2D, considered the navigation better for browsing than 2D, valued the ability to reinvent themselves more and appreciated cheaper virtual versions of products more. Lastly it was found that females’ avatars on average were younger.

In terms of age there was one significant difference where the group 18-24 was more confident purchasing a book from SL than the other groups. In terms of experience there was some correlation with hours spent.

For most comparisons there was a significant difference that indicated that the sample and the population it represented had a distinct view about each channel in relation to the question being asked. The most common result for the section comparing three channels was to consider offline to be preferable to both 2D websites and SL. 2D was usually preferred to SL but not always. The differences in preference were usually consistent without great fluctuations. While SL was usually the least preferable of the pair of channels the difference was not very big. This is an indication that SL could in the future compete with the other two established channels. A notable exception was question 35 where SL was preferred to both offline and 2D websites. This question asked which retail channel was the most entertaining. A second question was 36 that asked which channel made the participant feel they 'got away from it all' resulted in SL on average having a relative advantage over both of the other channels. These results are in line with the findings of the qualitative analysis where these issues were prominent. SL was also preferred to the other two channels for question 37 that enquired about which channel was more informative about the product. This was not in line with the qualitative analysis where the 2D Internet seemed to be preferred.

For the second section that compared SL to the two other channels one at a time SL was preferred significantly in most cases. The reason for SL being more popular in this section to the previous one was because while the previous section focused on important issues in retail from the consumers' perspective in general, the latter section focussed on potential relative advantages of SL that arose from the qualitative section. The issue with the most substantial preference was in question 51, the benefit of navigation over online 2D, 54 and 55, being able to be someone you are not, 58 and 59, instantly delivered virtual products.

CHAPTER SIX - IMPLICATIONS AND CONCLUSION

6.1 Introduction

The aim of this research was to identify what, if any, were the relative advantages of CVEs for retail in comparison to 2D navigation websites and offline. The findings produced in this thesis confirm that customers value retail channels differently in relation to different issues. Some light was shed on what these preferences were, the reasoning behind them and the level of support they commanded. Beyond the inherent value of any insight gained on those relevant issues an attempt was made to assess the relative advantage of one channel over another on those issues. This is useful because research has showed that a consumer would only adopt a new channel if it was perceived to offer an advantage to existing channels (Choudhury and Karahanna, 2008). The first section of this chapter will bring together the findings of the three phases of the data collection and analysis. The second section will discuss the value this research could have to retail companies directly. The third section highlights the contribution to scientific business research. The next section is the conclusion that gives an overview of the thesis and discusses the key objectives. The penultimate section summarizes the limitations of this research and the last section offers fruitful direction to build on this work.

6.2 Discussion of findings

6.2.1 Introduction

Choudhury and Karahanna (2008) apply the arguments stemming from the theory of Diffusion of Innovation (Rogers, 2003) to suggest that a consumer would adopt a new retail channel only if it was perceived to offer an advantage to existing channels. Furthermore they suggest that such a decision would have multiple dimensions of relative advantage, those being convenience, efficacy of

information and trust (Choudhury and Karahanna, 2008). Therefore each channel is in competition with the others in a multichannel environment (Teltzrow et al., 2007). From this basis the present research developed five issues that identified areas of possible relative advantages and the exploratory research was carried out.

This research was an iterative process. Each stage used a different method, with different strengths and different insights. This section marks the end of that iterative process and all the key insight are brought together. Some of these aspects were immediately apparent and based on functionality such as navigation, others were less so. As this research explored retail from the consumer's perspective any issue that arose from the data was retained and explored regardless of whether it was based on a fact such as the navigation of 3D being different to 2D navigation websites or an impression based on personal preferences. When discussing the findings of the quantitative section it is important to point out that this section explored the degree of support of the objectives, not their validity. To illustrate this point an example used in the qualitative section will be extended. In the focus groups and interviews a range of strong and conflicting beliefs were voiced in relation to after sales service in SL. Some did not want it to exist and some cited it as a great advantage of SL. This issue was explored in the quantitative section. The purpose was not to establish who was 'right' but to gain insight on where the average of the opinion was and what the variance was. Similarly a small number of issues that seemed to have support in the qualitative section did not have significant support in the quantitative section. This did not mean the participants that voiced them were wrong just that there were less people that had similar views. Importantly an issue with low support could be of interest for an organization with a niche targeting strategy.

At the same time issues that were supported by many, emphatically and with strong arguments in the qualitative section followed on by significant support in the quantitative section are important to all retailers in SL. Strong support is also an indication that these beliefs are related to fundamental features of the technology and business rather than personal idiosyncrasies.

The five research objectives that gave this research the direction at the start of the data collection will now frame part of the discussion on the findings. Additional findings are discussed in a subsequent section.

6.2.2 Findings related to the first objective

The first objective stated ‘a RA of VW compared to the 2D websites for e-commerce contains aspects of offline retail it includes that do not exist in the 2D Internet’. While it would not have been hard for someone to think of possible features this research relied on two stages of qualitative data collection to establish them.

From the qualitative data analysis issues relevant to this were primarily enjoyment, social shopping, a richer and more emotive 3D environment, ‘face to face’ and the shopping assistant, and to a lesser extent location. Apart from location that was not expressed by participants in the focus groups the rest were common to both data from the focus groups and the interviews. Enjoyment will be discussed in detail in the additional findings in section 6.2.7. An example of a feature that offline and CVEs share in common that the 2D web does not have and created more enjoyment was the ability to browse by walking around.

In the quantitative section there was no preference for the shopping assistant in comparison to offline on average. There was however a large significant support that the salesperson was a relative advantage compared to 2D websites. This was consistent with the qualitative section. There was however a large variance and there were some strong opposing views in the qualitative section and in the optional open ended question of the survey. The findings therefore suggest that, on average, the aspect of offline of having a shopping assistant is a relative advantage of CVEs compared to the 2D internet.

For navigation in the quantitative section SL was considered to have an advantage over both offline and 2D websites. It was considered a greater relative advantage when compared to 2D websites. Therefore the findings suggest that on average the aspect that offline and CVEs share compared to navigation in 2D is a relative advantage of CVEs compared to 2D internet. This may appear logical but beyond being an important issue for retailers to consider it illustrates the success of SL to convey the 3D navigation to a level where it achieves similar results to offline for the context of retail.

For sociability the quantitative analysis indicated a significant preference for SL over 2D websites with a medium effect. This was in line with the qualitative findings where many participants felt strongly about this. Therefore it can be concluded that sociable shopping is a RA of shopping in SL compared to 2D navigation websites.

In terms of location SL was preferred significantly but with a medium effect to 2D websites. This is in line with the qualitative findings where this had some support but was not an issue participants felt strongly about.

The last relevant issue was the ability to reinvent yourself and be someone you are not. This is clearly apparent in SL, one interview participant had a tail, but is it relevant to shopping? The quantitative results showed that the ability to reinvent oneself was a RA of shopping in SL compared to 2D navigation websites.

6.2.3 Findings related to the second objective

The second objective stated ‘a RA of VW retail compared to offline retail are aspects of 2D e-commerce it includes that do not exist in the offline retail environment’. This objective followed on from the logic of the first one. These were found to be convenience, speed, twenty four-seven availability, global reach, and additional information such as reviews and profiles.

In the quantitative section when participants were asked to compare the channels based on which one they would learn all they needed to know about the product 2D navigation websites were preferred to both other channels. SL was preferred to offline by some margin. This was an indication that features that SL and 2D websites had but were missing from offline were considered a RA.

In terms of convenience SL was considered to be at a disadvantage to both of the other channels. Issues that arose in the qualitative section such as 24 hour availability, access from the convenience of your home, on average were outweighed by the other conveniences of offline and inconveniences of SL. It is not clear if this is the situation at this point in time, given the current state of CVEs or a fundamental feature. This could be further explored.

6.2.4 Findings related to the third objective

The third objective stated ‘consumers vary their intended usage of VW across the different stages of the purchase process because the significance of the dimensions of RA may vary across those stages’. There were many potential dimensions to this issue as there are many models that identify variables and stages in this process. The research this thesis develops (Choudhury and Karahanna 2008), proposed a model with four stages but finally concluded that there was only evidence of three. The qualitative research found extensive detailed and emphatic support for those three but none for the fourth that is vendor selection. Therefore the quantitative section explored the three stages further.

For requirements determination the quantitative analysis found that 2D was the more popular than both the other channels, and offline was preferred over SL. 2D navigation websites are ideal for searching and viewing information on products while offline products can be handled so this result was logical. For the purchasing stage offline and 2D websites had no significant difference between them with SL having a significant difference and effect. SL seemed to be at a disadvantage for both of

these stages. This was in line with the indications of the qualitative section. The change in the preference for the first two channels between this stage and the one preceding it is one of many examples from this analysis that illustrates the distinct perceptions customers have of the value each retail channel offers.

For the last stage, after sales service the order was offline was more popular than both the other stages and 2D websites were more popular than SL. The margin however between SL and the other channels was much smaller. This is an indication that SL is more useful for after sales service than the other two stages. This is partly in line with the qualitative section where there was extensive and detailed support for SL for this issue and some participants preferred SL to 2D websites. This illustrates the value of using qualitative and quantitative methods to supplement each other.

6.2.5 Findings related to the fourth objective

The fourth issue stated that consumers purchasing behaviour in VW is different for simple and complex products. The qualitative findings indicated that for complex products most participants considered the offline retail to be better than the other two channels. Some considered two dimensional better because you get more information and you can use comparison websites. From those that considered CVEs to be better than 2D websites, most valued the ability to negotiate with a real person such as the shop assistant that they found especially beneficial for complex products.

The quantitative analysis for complex products found that offline was by far the more preferable than the other two channels. 2D websites were preferred to SL. These were the most typical results. All the differences were significant with a large effect.

When comparing complex products specifically in terms of which they would feel more confident with offline was preferred to the other two channels and 2D websites were preferred to SL. The

differences were very big and the average for SL was negative meaning on average participants would not use it to purchase such products. This is particularly insightful. The theory this thesis uses posits that a channel needs a relative advantage to be chosen. If consumers' perception of a SL for complex products is negative then the channel is inherently ill-suited for this regardless of the competition.

For simple products the quantitative research found offline and 2D websites were close together and both were preferred to SL by some margin. For the similar question focusing on confidence the results were similar with a small but significant preference for offline over both of the other channels. While SL was not preferred in either comparison, as in complex products, for simple products however the average was positive. This means on average, participants would use it but they prefer other channels. These nuances in the perceived value of a channel are the type of findings this thesis was designed to identify. If an organization was pursuing a differentiation or harmonization strategy, in other words any strategy other than standardisation/homogenization, avoiding or de-emphasizing simple products in VW may help optimise the multichannel retail results.

6.2.6 Findings related to the fifth objective

The fifth objective stated 'VW such as SL have the RA of a higher degree of Institutional Trust compared to 2D navigation websites'. The qualitative section found four types of responses. The first and most common was to group the two dimensional and three dimensional together because the underlying technology was the same. There were some that trusted the 2D web more than CVEs the most common reason being that it was a more established technology. A second reason for this was because they valued the ability to provide feedback a functionality that many 2D websites offer. From those that preferred the three dimensional retail of CVEs some cited the security of the payment system. The buyer not receiving your banking details was a feature especially appreciated. Others

cited the SL administrations role in identifying and warning about specific threats. These were indications that SL as an institution influenced 'institutional trust' positively.

When the quantitative analysis measured the responses to the question asking whether the payment method was safer offline or in SL there was no significant difference. The response showed no preference between the two channels, they were almost perfectly matched. When making the comparison with 2D websites SL was preferred significantly, with small to medium effect. This is an indication that SL has the RA of higher institutional trust compared to 2D websites. There were indications from the qualitative analysis that consumers valued the role of SL as an institution in relation to trust but it was not expected to be as trustworthy as offline. The sample being from SL users should be factored into this result when considering the implications.

As posited by Choudhury and Karahanna (2008) trust is an issue that can be used to compare retail channels. Therefore a better understanding of trust improves the ability to make those comparisons. Secondly a better understanding of trust can be used to improve the value a retailer offers to the consumer. This can be achieved by adapting the business model to optimise value (Goel and Prokopec, 2009) or in some other way. Lastly the institution, in this case the CVE can take measures to improve the level of institutional trust the consumer perceives (Pavlou and Gefen, 2004; Patnasingham et al., 2005).

6.2.7 Additional findings

In the quantitative section, in relation to which channel was the most enjoyable there was no significant preference between the three channels. The average of the results was very high indicating that participants considered all channels to offer significant enjoyment value. SL was valued in relation to entertainment far more than the other two channels. In a related question about which channel is entertaining SL was preferred by far the over both other channels. 2D online was preferred

to offline. This was one of the few issues where SL was preferred to both channels and this indicates that entertainment is a RA of SL. This is in agreement with other research into SL that found entertainment to be one of the main strengths (Bell et al., 2007; Huvila et al., 2010). In a second related question about escapism it was also RA of SL over both the other channels. This is also in agreement with the other research (Huvila et al., 2010; Ching et al., 2011). While enjoyment was not considered a RA in the quantitative section the support showed this was a strength of SL. This is also in agreement with other research that identify enjoyment as a strength of SL (Seungju, 2013; Pence 2008).

When comparing between the three channels the two-step cluster analysis identified a cluster that was mostly negative towards CVEs. There were no clusters that were mostly negative towards offline or 2D navigation B2C e-commerce. In relation to the questions of section three the two-step cluster analysis once again identified a cluster that was mostly negative towards SL. This is an indication that CVEs are considered to be at a fundamental disadvantage to the other two channels for a cluster of participants. For the clusters that were mostly positive towards SL the most significant questions to the formation of the clusters were directly about purchasing. This is an indication that participants that are positive specifically about purchasing are more positive about all the related issues and participants that are not positive specifically about purchasing are mostly negative about the other issues. The two clustering methods used, two-step and a combination of hierarchical and k-means, failed to identify clusters with a fair or strong degree of coherence and separation, they were all weak.

6.3 Implications for retail companies

The insight gained in this thesis is directly applicable to retail companies. These companies constantly pursue a better understanding of the customer and the channel in order to improve their decision making (Keller, 2010). The information on the customer needs to be relevant, accurate and reliable. Both tactical and strategic decisions are made to satisfy these customer needs. With customers transferring the views they form of an organization from one channel to another (Bock et al., 2012) the stakes are very high. An unsuccessful endeavour into CVEs could harm an organizations image that was painstakingly built over decades. This research does not attempt to give an answer that will cover the particular context of every organization and all the intricate trade-offs. It can however support those decision makers to make better informed optimum choices. The findings of this research can enhance every aspect of retail such as display, product delivery, return policy, support, after sales support and marketing. In terms of marketing this is especially important for branding, customer profiling, advertising and promotion in order to maximize both the push and the pull (Keller, 2010).

From the qualitative section the issues identified are all potentially useful. A belief does not need to be popular to be useful. If we take the example used previously of the shopping assistant there was a wide range of opinions. One company could choose to target the niche of customers that appreciate a shopping assistant. Alternatively a company could attempt to appease all of them by having the shopping assistant as an unobtrusive option.

The quantitative section where channels are measured between themselves is also useful to management as they can make decisions in relation to their retail channels. With a finite amount of resources decisions need to be made between options. If one option is preferred by customers on a certain issue then that channel offers a better return on the investment.

The business model of a company can be adapted to utilise the insight gained. A company can have a different business model for each channel, in a similar way that some companies have a different business models in different countries. The range and strength of the participants beliefs supported choosing a value/customer-orientated business model over an activity-role orientated one (Ostenwalder, et al, 2005). In addition to enhancing the development of the business model the decision whether to enter SL or similar CVEs can be better informed. The benefit of better informed business models for CVEs today is analogous to the interest in business models for the internet in general in the early stages of 2D online commerce.

In addition to adapting business models the findings can be utilized to optimize the multichannel strategy. This strategy does not focus on achieving the best result for one channel but on the overall result for all the channels the organization is active in. As discussed in the literature review this can be a standardised/homogenized strategy or a harmonized strategy where there is coordination but the offering of each channel can be different (Zhang et al., 2010). This process has been referred to as a craft suggesting there is no specific solution or model (Zhang et al., 2010). Identifying and gauging the RA of the channels on many significant issues enhances the multichannel strategy ‘craftsmen’ and ‘craftswomen’.

While models are usually relatively rigid representations of the main value generating processes the retail strategy can cover more details and adapt more regularly. A simple example would be whether to offer virtual test drive in SL by a car manufacturer as Alpha Romeo did. Would this benefit? What are the customers’ views on navigation and avatars? What attracts them to CVEs so that this can be emphasized? Should parts of this promotion be delivered by other channels? These are examples of questions this research assists in answering.

In addition to the spectrum from homogenous to separate it is useful to distinguish four strategies for an organization’s multichannel presence. These are ‘virtual’, where the organization does not have a physical presence, ‘parallel’, where the virtual presence is not linked to other channels, ‘mirror’ like

homogenous where the channels mirror each other and 'synergy', where each channels unique strengths, or relative advantages are utilised (Goel and Prokopec, 2009; Steinfield et al., 2000). In relation to these multichannel strategies this research favours the synergies strategy in particular. The findings offer some indications as to how the optimum results can be achieved with the synergies strategy by taking into consideration the relative advantages identified. This research also finds evidence that this strategy can deliver the best results for the customer. Identifying this strategy as the one with the most potential is not however an end point but the starting point of achieving the optimum result. This research also offers a basis for the coordination between channels to achieve synergies and harmonization between the channels and between the channels and the customer.

6.4 Implications for research

The findings of this research, summarized in this chapter, have implications for research both as a whole in relation to multichannel retail research and for specific areas of research such as e-commerce, business models, CVEs, trust, technology acceptance, innovation and research methods. The most significant of these findings are identifying the Relative Advantage of CVEs for retail. While participants showed a preference for offline and 2D in most situations there was evidence that the emotional reaction, enjoyment, entertainment, sociable shopping, the ability to reinvent yourself, convenience and institutional trust were RA of Second Life in relation to the other two channels. These findings were reached having used Choudhury and Karahanna (2008) as a starting point and after carrying out extensive data collection and analysis. They were prevalent in all three stages of the data collection and analysis and are therefore strongly supported.

Comparing the advantages found in this research for CVEs to those identified by Novak (2011) of higher interactivity, a sense of place, an environment that can be manipulated and a more dynamic, active way of learning compared to 2D internet there was evidence that supported all of them. In the retail context however interactivity was far more prevalent. The broad range of RAs that were held by

the majority of the participant but also the opposing views and minimal consensus support the multipurpose model (Verhagen et al., 2009). This model suggested that a combination of utilitarian and hedonic reasons drive the usage of CVEs (Verhagen et al., 2009). Comparing the findings of this research to evidence of the positive influence of avatars as sales agents e.g. Holzwarth et al. (2006), there was evidence that supported this influence. There was however a niche that disliked avatars as salespeople.

A second contribution was extending Choudhury and Karahanna (2008) to include CVEs. Originally the model was only used to compare bricks and mortar and 2D online. A third related contribution is to propose an extension of that model (Choudhury and Karahanna, 2008) to include enjoyment in order to be effective when considering CVEs. Enjoyment has been used in many similar models in the past in relation to TAM but not for the purpose of identifying the RA of retail channels. Previous research had identified enjoyment as a factor in purchasing virtual products (Guo and Barnes, 2009a; Guo and Barnes, 2009b) and using CVEs for business activities (Shen and Eder, 2007). This research supports those findings. Its significance emerged from the broad qualitative data and was prevalent in all three stages including the quantitative stage. The proposed model is:

Relative Advantage of a retail channel = Information Efficacy + Convenience + Institutional Trust + Enjoyment.

A fourth contribution to research is the literature review that brings together six areas. In the spirit of multichannel research these areas were ‘harmonized’ achieving synergies in the analysis and insight. As with the broad data collection the broad literature review created challenges but it enriched the research and the findings. A fifth implication for research is the research methodology that applied the relevant model of Choudhury and Karahanna (2008) comparing the RA of three retail channels. A sixth contribution is the five main objectives explored and the secondary issues they encompass as discussed in chapter four. The seventh contribution is the assessment of the significance of each of the five objectives and the quantitative exploration of RA as discussed in chapter five.

An eighth contribution is that by allowing the many and varied views of the participants to emerge the advantage of a value/customer-orientated business model over an activity-role orientated one (Ostenwalder et al., 2005) were illustrated. In order to satisfy these customers, business models should start from the multichannel customers' needs and develop the activities to satisfy those needs rather than implementing typical structures and models regardless of the channel. This is in agreement with Cagnina and Poian (2009).

6.5 Conclusion

The starting point of this research was a relatively new technology whose place, if any, in a multichannel retail environment was unclear. The first step was an extensive literature review of multiple related areas. Before looking for answers the right questions had to be formed. The basis for those questions and this thesis was a research paper that explored the Relative Advantage of retail channels (Choudhury and Karahanna, 2008). The main limitation of Choudhury and Karahanna (2008) as stated by the authors themselves was the limited data they used. Therefore it was decided that extensive data collection utilizing multiple methods would be applied. It was also decided to start the data collection broadly and successively narrow the focus as the findings emerged. The initial focus was given by identifying five objectives to explore. Beyond being important to explore, these objectives narrowed the focus of this broad research. The next step was the methodology. The methodology was developed in order to achieve the broad starting point, with less structure and progressively narrow down. The first step was to conduct focus groups where many issues were identified for further exploration and the insight gained fed into the questions for the next stage, the interviews. The primary goal of the interviews was to explore the meaning behind the beliefs on the objectives. The secondary goal was to allow for new issues to emerge. The last data analysis was the large survey of over 600 participants conducted within SL. The primary goal of this stage was to establish the level of support for each view. The secondary goal, as with the previous analysis, was to

allow for any other insight to emerge. The extensive iterative process resulted in refined insight on the relative advantage of CVEs for retail.

This research found strong views on the channels advantages and disadvantages that illustrate the value of comparing and contrasting them. A good understanding of the potential RA of CVEs encapsulated in the five objectives was achieved. The first objective identified was that the Relative Advantages of CVEs to the 2D navigation websites for retail were aspects of the offline world that CVEs included. These are primarily enjoyment of social shopping, a richer and more emotive three dimensional environment, 'face to face' interaction and the shopping assistant. To a lesser extent a minority appreciated location and navigation. The second objective stated that some advantages of CVEs compared to the offline world for retail were aspects of the 2D navigation websites that CVEs include that are not present or more difficult offline. These were identified as convenience, speed, twenty four-seven availability, global reach, and additional information such as reviews and profiles. The third objective was that consumers would vary their use of CVEs across different stages of the purchase process because the RAs would vary across each stage. A number of participants considered SL to be better for payment and after sales service. The fourth objective stated that a consumer's usage of CVEs would vary for simple and complex products. The majority of participants considered the 2D web and offline as the best for simple products. For complex products overall, most participants considered the offline retail as the best. Some considered two dimensional better because you get more information and you can use comparison websites. Those that considered SL to be better than two dimensional, once again valued the ability to negotiate with a real person such as the shop assistant which they found especially beneficial for complex products. Lastly the fifth objective stated that CVEs such as SL may have a higher degree of institutional trust compared to the two dimensional Internet. There were four types of responses. The first and most common type of responses were to group the two dimensional and three dimensional together because the underlying technology is the same. There were some that trusted the two dimensional web more than CVEs the most common reason being that it was a more established technology. A second reason for this was because they valued the ability to provide feedback that many two dimensional websites offer. Those that preferred

the three dimensional retail of CVEs sighted the payment system as the reason and some highlighted how Second Life, the 'institution' influenced 'institutional trust' positively. A secondary contribution that emerged from the data was made in identifying enjoyment as an extension of the Choudhury and Karahanna, (2008) model. Including enjoyment in the model allows it to be more effective when considering CVEs.

The analysis of the survey found that for many issues SL was the last choice with offline usually first and 2D navigation websites second. However, there are some exceptions. First was the question that asked which retail channel was the most entertaining for which SL was the first preference. A second question that asked which channel made the participant feel they 'got away from it all' resulted in SL on average having a RA. These results are in line with the findings of the qualitative analysis where these issues were prominent. SL was also preferred for the question asking about which channel was more informative about the product. This was not in line with the qualitative analysis where the 2D Internet seemed to be preferred. SL was also preferred in terms of navigation over 2D websites. Furthermore SL was preferred for its capacity to allow someone to reinvent oneself and pretend to be someone they are not. Lastly virtual products were considered an advantage of SL. Both the clearer indications and the more subtle nuanced ones are useful for SL retailers to better understand their potential customers and optimise the value they offer either by adapting their business model (Goel and Prokopec, 2009) or in some other way.

6.6 Limitations

6.6.1 Limitations of qualitative research

The limitations have been pointed out where relevant throughout this thesis. In addition to what has been mentioned the relatively new and dynamic nature of CVEs means this research must be

considered exploratory. The way CVEs are being utilised is changing. If they are used in a different way in the future, or the technology improves significantly, consumers' beliefs may evolve. Secondly, while the goal is to develop our knowledge of CVEs all the data was collected in relation to SL. This was done for the practical reasons discussed. This thesis focused on issues that are present in most CVEs that can be used for retail but in spite of this the particularities of SL may have impacted the findings. The one issue that is very specific to SL is that of institutional trust. In this case the institution is SL and the method of payment is particular to SL. Most CVEs however use the same method of first purchasing an in-world currency that is then used for subsequent purchases.

Regarding the participants of the interviews despite them matching the requirements they were all from England which means a degree of caution must be exercised when generalizing these findings to other nations. Lastly in terms of the analysis and findings each issue and each aspect of these issues should be explored further in order to achieve a deeper understanding of them and assess their significance.

Another limitation as in most qualitative research was the active role of the researcher in the data collection. Every effort was made to fulfil the functions necessary without biasing the participants. Despite this some influence cannot be ruled out. Lastly in order to address the primary weakness of the qualitative section, which was the inability to offer empirically validated results that could be generalized; this research was continued with the administration of a survey covering the same objectives.

6.6.2 Limitations of the quantitative research

The quantitative analysis also had its limitations and every effort was made to minimise these limitations. Firstly this research was in a given context. Like the interview this context was SL. Once again care was taken to focus on features that most CVEs share rather than idiosyncrasies of SL. The

second limitation was the sample. The sample was taken from experienced users of SL. These users may have different preferences to other samples. Furthermore in relation to the sample the percentage of participants that had bought real life products in SL was low at 11% and this weakened the reliability of the results related to that issue. Despite this the stages of the purchasing process are similar between real and virtual products apart from the delivery stage. Each specific method also had its limitations the t-tests when combined together increase the possibility of type one errors. For the objectives of this thesis the t-tests were implemented and discussed individually. The two-step clustering method has the limitation that it can be influenced by the order of the data. To mitigate this limitation the cases were put in random order by ordering on an insignificant aspect.

6.7 Directions for future research

In terms of the criteria of convenience when the three channels were compared SL was last. Issues that arose in the qualitative section such as 24 hour availability, access from the convenience of you home, on average were outweighed by the other conveniences of offline and inconveniences of SL. It is not clear if this is the situation at this point in time, given the current state of CVEs or a fundamental feature. This could be further explored along with seeking out new ways to enhance the convenience of CVEs.

Secondly this research illustrated how simple and complex products influenced the consumers' choice of channel. These terms and the questions that enquired about them were at a high level of abstraction. This level of abstraction was ideal for this research however more in-depth research on them would be useful. Thirdly given the significance of entertainment and enjoyment further research into these issues in this context would be useful.

A fourth avenue for future research would be to explore the possibilities of incorporating these findings into Business Intelligence systems. In the fast paced world of retail decisions are made about resources, especially in relation to online marketing, often on a day by day basis. The findings, particularly those from the quantitative section could be incorporated into such systems and aid decision making.

The fifth area for further research on these findings would be to improve existing business models. While a B2C e-commerce company could use the findings of this research to adapt their business model further research could explicitly identify what those changes could be. The area of BM is extensively researched and constantly updated. These updates usually document a new model that emerged in practise. The results of this thesis could be used to propose new improvements that have not yet been used in practice.

A sixth area for further research could be to further test and utilize the extended model for comparing retail channels. The proposed model is: $\text{Relative Advantage of a retail channel} = \text{Information Efficacy} + \text{Convenience} + \text{Institutional Trust} + \text{Enjoyment}$. Similar models are used for technology adoption but not for comparing between retail channels.

Lastly, the research of the adoption of CVEs can be extended further by comparison with research of the adoption of network systems through ideas such as network effects (Shapiro and Varian, 1999) and transaction costs (Williamson, 1981). After exploring CVEs as channels competing with other channels it would be useful to further explore them as network systems positioned alongside other network systems.

References

- Afuah, A. and Tucci, C. (2003). Internet business models and strategies. Boston: McGraw Hill.
- Ahsley, D. and Orenstein, D.M. (2005). Sociological theory: Classical statements. Boston: Pearson Education.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour. In J. Kuhl and J. Beckmann, Action control: From cognition to behaviour, 11-39. New York: Springer.
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Process*, 179-211.
- Akhter, F. (2004). Trusting electronic commerce: social, personal and technical perspective. In *Proceedings of the international conference of the resources management association: Innovation through information technology*, 1415-1419.
- Ayer, A.J. (1936). Language, Truth, and Logic. London: Victor Gollancz Ltd.
- Bagozzi, R.P. and P.R. Warshaw. (1992). Development and test of a theory of technological learning and usage. *Human Relations*, 660-686.
- Bangura, A. (1977). Self-efficacy: Towards a unifying theory of behavioral change. *Psychology review*, 191-215.
- Barnes, S., and A.D. Pressey. (2011). Who needs cyberspace? Examining drivers of needs in Second Life. *Internet Research*, 236-254.
- Barnes S. and Pressey A. (2012). In Search of the 'Meta-Maven': An Examination of Market Maven Behavior across Real-Life, Web, and Virtual World Marketing Channels, *Psychology & Marketing*, 167-185.
- Barnett, V. (2003). Sample survey, principles and methods, London: Arnold.

- Bainbridge, W. S. (2007). The scientific research potential of virtual worlds. *Science*, 472–476.
- Bazeley, P. (2004). Issues in mixing qualitative and quantitative approaches to research. In R. Buber and J.: Richards, L. Gardner , *Applying quantitative methods to marketing management research*, pp. 141-156. London: Palgrave Macmillan.
- Bell, L., Peters, T. and Pope, K. (2007). Get a Second Life!: Prospecting for gold in a 3D world. *Computers in Libraries*, 10-15.
- Bellenger, D.N., Bernhardt, K.L. and Goldstucke, J.L. (1976). Qualitative research in marketing. Chicago: American Marketing Association.
- Bellman, R. and Clark, C. (1957). On the construction of a multi-stage, multi-person business game. *Operations Research*, 469-503.
- Bellman, S., Lohse, G.L. and Johnson, E.J. (1999). Communications of the ACM. *Predictors of online buying behaviour*, 32-48.
- Bello, D.K., Leung, L. Radebaugh, L., Tung R.L. and Witteloostuijn, A.V. (2009). Student samples in international business research. *Journal of international business studies*, 361-364.
- Benford, S., Greenhalgh, C., Rodden, T. and Pycock, J. (2001). Collaborative Virtual Environments. *Communications of the ACM*, 79-85.
- Berger, H., Dittenbach, M. and Merkl, D. (2006). Playing the e-business game in Virtual Worlds. Proceedings of the 20th conference of the Computer-Human Interaction special group, 333-336.
- Berman, B. and Thelen, S. (2004). Managing a well-integrated multichannel retail strategy. *International Journal of Retail and Distribution Management*, 147-156.
- Berthon, P. (2010). Advocating avatars: The salesperson in Second Life. *Journal of Personal Selling Sales Management*, 195-208.

- Bhattacharaya, R., Devviney, T. and Pillutla, M.M. (1998). A formal model of trust based outcomes. *Academy of Management Review*, 459-472.
- Bianchi, C. and Rivenbark., W.C. (2012). A comparative analysis of performance management systems: The cases of Sicily and North Carolina. *Public Performance and Management Review*, 509-534.
- Black, T. (1999). *Doing Qualitative Research in the Social Sciences*. London: Sage.
- Bohlen, J.M. and Beal, G.M. (1957) The diffusion process. *Agriculture Extension Service, Iowa State College, Special Report*. 56-77.
- Bourlakis, M., Papagiannidis, S. and Li, F. (2009). Retail spatial evolution: Paving the way from traditional to metaverse retailing. *Electronic Commerce Research*, 135-148.
- Bock G.W., Huei J.L., Kuan H. and Hyun Kim J.(2012). The progression of online trust in the multi-channel retailer context and the role of product uncertainty. *Decision Support Systems*, 97–107.
- Burrell, G. and Morgan, G. (1979). *Sociological Paradigms and Organisational Analysis*. London: Heinemann.
- Bulearca, M. and Bulearca, S. (2012). Virtual goods: insanity or just a smart business model? *International Journal of Innovation in the Digital Economy*, 1–9.
- Cagnina, M.R, and Poian. M. (2009). Beyond e-business models: The road to Virtual Worlds. *Electronic Commerce Research*, 49-75.
- Cambell, D.T. and Fiske, D.W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychology Bulletin*, 81-105.
- Cassell, C. and Symon, G. (2004). *Essential guide to qualitative methods in organizational research*. London: Sage.

- Chandra, Y. and Leenders, M. (2012). User innovation and entrepreneurship in the virtual world: A study of Second Life residents. *Technovation*, 464–476.
- Chang, Y. and McFarland, D. (1999). Managing a well-integrated multichannel retail strategy. *International Journal of Retail and Distribution Management*, 147-156.
- Changsoo, K., Sang-Gun L. and Minchoel K. (2012). I became an attractive person in the virtual world: Users' identification with virtual communities and avatars. *Journal Computers in Human Behavior*, 1663-1669.
- Ching, J.K., Hui, Y.T. and Ya, T.C. (2011). Effects of virtual-experience combinations on consumer related sense of virtual community. *Internet Research*, 408-434.
- Choudhury, V. and Karahanna, E. (2008). The Relative Advantage of Electronic Channels: A Multidimensional View. *Management Information Systems Quarterly*, 179-200.
- Comte, A. (1830). Course of positivist philosophy. Paris: Hermann.
- Cook, T.D. and Campbell, D.T. (1979). Quasi-experimental designs for research. Chicago-Illinois: Rand McNally.
- Copeland, M.T. (1923). The Relation of Consumers' Buying Habits to Marketing Methods, *Harvard Business Review*, 282–289.
- Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319-340.
- Davis, A., Murphy, J., Owens, D., Khazanchi, D. and Zigurs, I. (2009). Avatars, people, and virtual worlds: Foundations for research in metaverses. *Journal of the Association for Information Systems*, 91–117.
- De Leeuw, E.D. (2001). Reducing missing data in surveys: An overview of methods. *Quality and Quantity*, 147-160.

- Denzin, N.K, and Lincoln, Y.S. (2003). Handbook of qualitative research. Thousand Oaks: Sage.
- Dhar, S. and Varshney. U. (2011). Challenges and business models for mobile location based services and advertising, *The communications of the ACM*, 34-46.
- Dholakia U.M., Kahn, B.E. Reeves,R., Rindfleisch, A., Stewart D. and Taylor, E.(2010). Consumer Behavior in a Multichannel, Multimedia Retailing Environment, *Journal of Interactive Marketing*, 86-95.
- Domina T., Lee, S.E. and MacGillivray M. (2012). Understanding factors affecting consumer intention to shop in a virtual world, *Journal of Retailing and Consumer Services*, 613–620.
- Doney, P.M. and Cannon, J.T. (1997). An examination of the nature of trust in buyer seller relationships, *Journal of Marketing*, 35-51.
- Durkheim, E. (1895). The Rules of Sociological Method. Paris: Felix Alcan.
- Eisenbeiss, M., Blechschmidt, B., Backhaus K. and Freund P.A. (2012) The (Real) World Is Not Enough: Motivational Drivers and User Behavior in Virtual Worlds, *Journal of Interactive Marketing*, 4-20.
- Fetscherin, M. and Lattemann, C. (2007). User acceptance of virtual worlds: *Journal of Electronic Commerce Research*, 231-242.
- Field, A. (2009). Discovering Statistics Using SPSS. London: Sage.
- Fishbein, M. and Ajzen, I. (1975). Belief, attitude, intention and behaviour: An introduction to theory and research. Reading: Addison Wesley.
- Fisman, R. and Khanna, T. (1999). Is trust a historic residue? Information flows and trust levels.” *Journal of economic behaviour and organization*, 79-92.
- Forbord, M., Schermer M. and Griesmair. K. (2012). Stability and varitey: Products, organization and institutionalization in farm tourism. *Tourism Management*, 895-909.

Fox, J. and Bailenson, J. N. (2009). Virtual self-modelling: The effects of vicarious reinforcement and identification on exercise behaviors. *Media Psychology*, 1–25.

Gage, N.L. (1989). The paradigm wars and their aftermath: A historical sketch of teaching since 1989. *American Educational Research Association*, 4-10.

Gartner. (2007). Gartner says 80 percent of active internet users will have a “Second life” In the virtual world by the end of 2011. Retrieved August 21 2009 from <http://www.gartner.com/it/page.jsp?id=503861>

Gartner. (2008). Gartner’s top 10 disruptive technologies for 2008 to 2012. Retrieved 3 November 2011 from <http://searchstorage.techtarget.com.au/news>

Gartner (2010). Gartner’s 2010 hype cycle special report evaluates maturity of 1800 technologies. Retrieved September 15 2010 from <http://www.gartner.com/it/page.jsp?id=1447613>.

Gefen, D. (2002). Reflections on the dimensions of trust and trustworthiness among online consumers. *ACM Sigmis Database*, 38-53.

Gefen, D. and Straub, D. (2003). Managing user trust in B2C e-services. *e-Service Journal*, 7-23.

Gefen, D., Karahanna, E. and Straub, D.W. (2003). Trust and TAM in online shopping: An integrated model. *Management Information Systems Quarterly*, 51-90.

Ghauri, P.N. and Gronhaug, K. (2005). Research methods in business studied: A practical guide. Boston: Pearson Education,.

Ghosh, A.K. and Swaminatha. T.M. (2001). Software security and privacy risks in mobile e-Commerce. *Communications of the ACM*.

Ghosh, S. (1998) Making sense of the internet. *Harvard Business Review*, 101-116.

Goel, L. and Prokopec, S. (2009). If you build it will they come?-An empirical investigation of consumer perceptions and strategy in virtual worlds. *Electronic Commerce Research*, 115-134.

- Golden-Biddle, K. and Locke, K. (2002). An introduction to qualitative research. In Handbook of research methods in industrial and organizational psychology. Oxford: Blackwell.
- Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 136-138.
- Guest, G., Bunce, A., and Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 59-82.
- Guittou, M.J. (2012). The immersive impact of meta-media in a virtual world. *Computers in Human Behavior*, 450-455.
- Guo, Y. and Barnes, S. (2007). Why people buy virtual items in virtual worlds with real money. *The DATA BASE for Advances in Information Systems*, 69-76.
- Guo, Y. and Barnes, S. (2009). Virtual item behaviour in virtual worlds: an exploratory investigation *Electronic Commerce Research*, 77-96.
- Guo, Y. and Barnes, S. (2009). Why do people buy virtual items in virtual worlds? An empirical test of a conceptual model. ECIS 2009 Proceedings. Paper 449. Retrieved June 31 2009 from <http://aisel.aisnet.org/ecis2009/449>
- Haenlein, M. and Kaplan, A.M. (2009). The fairyland of Second Life: Virtual social worlds and how to use them. *Business Horizons*, 563-572.
- Han, J., Cambel, N., Jokinen, K. and Wilcock, G. (2012). Investigating the use of Non-verbal Cues in Human-Robot Interaction with a Nao robot, *IEEE 3rd International Conference on Cognitive Infocommunications*, 679-683.
- Hassounah, D. and Brengman, M. (2013). A motivation-based typology of social virtual world users *Computers in Human Behavior* -In press.
- Haydock, M. (2000). Multichannel strategies win confidence. *DM News*, 32-43.

Heitz-Spahn, S. (2013). Cross-channel free-riding consumer behavior in a multichannel environment: An investigation of shopping motives, sociodemographics and product categories. *Journal of Retailing and Consumer Services*, 570-578.

Hirschheim, R. A. (1992). Information Systems Epistemology: A Historical Perspective. In *Information Systems Research: Issues, Methods and Practical Guidelines*, edited by R. Galliers, 28-60. London: Blackweel Scientific Publications.

Hirschman, E.C. and Holbrook, B. (1982) Hedonistic consumption: Emerging concepts, methods and propositions. *Journal of Marketing*, 92-101.

Holsapple, C.W. and Wu. J. (2007). User Acceptance of Virtual Worlds: The Hedonic Framework. *The DATA BASE for Advances in Information Systems*, 86-89.

Holzwarth, M., Janiszewski, C. and Neumann, M. M. (2006). The Influence of Avatars on Online Consumer Shopping Behavior. *Journal of Marketing*, 19-36.

Hopkins, L. (2011). Second Life: Very Much Still here and Relevant. Better Communication Results. Retrieved June 10 2012 from <http://www.leehopkins.net/2010/08/04/second-life-very-much-still-here-and-relevant/S>

Huvila, I., Holmberg, K. Ek, S. and Widen. G.W. (2010). Social capital in Second Life. *Online Information Review*, 295-316.

Independent (2002). Is Amazon turning the corner to profitability? 19.

Jarvenpaa, S., Knoll, K. and Leidner. D. (1998). Is anybody out there? Antecedents of trust in global virtual teams. *Journal of Management Information Systems*, 29-64.

Jahng, J., Jain, H. and Ramamurthy, K. (2001). The Impact of Electronic Commerce Environment on User Behavior: The Case of a Complex Product. *e-Service Journal*, 41-53.

Jean-François B. and Bodur, H.O. (2010). Avatars as Information: Perception of Consumers Based on their Avatars in Virtual Worlds, *Psychology & Marketing*, 741-765.

- Junglass, I.A., Johnson, N.A. Steel, D.J. Abraham, D.C. and Loughlin. P.M. (2007). Identity formation, learning styles and trust in Virtual Worlds. *Association of Computing Machinery*, 90-96.
- Kalakota, R. and Robinson. M. (2003) E-Business 2.0 Roadmap for success. Reading: Wesley.
- Kaplan, A.M. and Hanlein, M. (2009). The fairyland of Second Life: Virtual social worlds and how to use them. *Business horizons*. 563-572.
- Kerlinger, F. and Lee, H. (2000) Foundations of bahavioural research. Orlando: Harcourt College Publishers.
- Keeling, K., McGoldrick, P., and Beatty, S. (2010). Avatars as Salespeople: Communication Style, Trust, and Intentions. *Journal of Business Research*, 793-800.
- Keller, K.L. (2010) Brand Equity Management in a Multichannel, Multimedia Retail Environment. *Journal of Interactive Marketing*, 58-70.
- Khalifa, M. and Shen K. N. (2008). Driver for transactional B2C M-Commerce adoption: extended theory of planned behaviour. *The Journal of Computer Information Systems*, 111-132.
- Kim, H.W., Hock, C.C. and Sumeet, G. (2007). Value based adoption of mobile internet: An empirical investigation. *Decision Support Systems*, 111-117.
- Kim H.W., Chan H.C. and Kankanhalli (2012). What Motivates People to Purchase Digital Items on Virtual Community Websites? The Desire for Online Self-Presentation. *Information Systems Research*. 1232-1245.
- Kim, J. and Forsythe, S. (2008). Adoption of Virtual Try-on technology for online apparel shopping. *Journal of Interactive Marketing*, 45-59.
- Kim, S.G. and Prabhakar. B. (2000). Initial trust, perceived risk, and the adoption of internet banking. *Proceedings of the 21 conference on information systems*, 537-543.

- King, N. (2004). Using templates in thematic analysis of text. In *Essential guide to qualitative methods in organizational research*, by C. Cassel and G. Symon, 256-270. London: Sage.
- Kohler, T., Fueller, J., Stieger, D. and Matzler, K. (2011). Avatar-based innovation: Consequences of the virtual co-creation experience. *Computers in Human Behavior*, 160–168.
- Korgaonkar, P., Silverblatt, R. and Girard, T. (2006). Online retailing, product classifications, and consumer preferences. *Internet Research*, 267-288.
- Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behaviour. *Information Systems Research*, 205-223.
- Konus U., Verhoef, P.C. and Neslin, S.A. (2008). Multichannel Shopper Segments and Their Covariates, *Journal of Retailing*, 398–413.
- Kramer, M. (1999). Trust and distrust in organizations: Emerging perspectives, enduring questions. *Annual Review of Psychology*, 568-598.
- Krauter, S.G., Kalucha, E.A. and Fladnitzer, M. (2006). Perspectives of online trust and similar constructs: A conceptual clarification. *Proceedings of the international conference on electronic commerce*, 235-243.
- Krugman, H.E. (1965). The Impact of TV Advertising: Learning without Involvement. *Public Opinion Quarterly*, 349–356.
- Klein, L.R. (1998). Evaluating the Potential of Interactive Media through a New Lens: Search versus Experience Goods. *Journal of Business Research*, 195–203.
- Kumar, S., Chhugani, J., Kiim, D., Nguyen, A. and Dubey, A. (2008). Second Life and the new generation of Virtual Worlds. *Computer*, 46-53.
- Kumar, V. and Venkatesan, R. (2005). Who are the multichannel shoppers and how do they perform?: Correlates of the multichannel shopping behaviour. *Journal of Interactive Marketing*, 44-62.

Laudon, K.C and Traver, C.G (2004). E:Commerce: Business, technology, society. Reading: Addison Wesley.

Lazonick, W. (2009). The new economy business model and the crisis of U.S. capitalism. *Capitalism and society*.1-67.

Lee K. C. and Chung N. (2008). Empirical analysis of consumer reaction to virtual reality shopping mall. *Computers in Human Behaviour*. 88-104

Lehdonvirta, V. (2009). Virtual item sales as a revenue model: identifying attributes that drive purchase decisions. *Electronic Commerce Research*, 97-113.

Lessler, J.T. and Kalsbeek, W.D. (1992). Nonsampling Error in Surveys. New York: Wiley.

Levene, H. (1960). Robust test for equality of variance. Stanford: Stanford University Press, 278-292.

Levy, M. and Weitz, B. (2009). B.A. Retailing Management. New York: McGraw Hill.

Lewicki, R. J. and Bunker, B. B. (1995). Trust in relationships: A model of development and decline. In B. B. Bunker, J. Z. Rubin, & Associates (Eds.), *Conflict, cooperation and justice: Essays inspired by the work of Morton Deutsch*: 133-173. San Francisco: Jossey-Bass.

Linder, J. and Cantrel, S. (2000). Changing business models: Surveying the landscape. Accenture Institute for strategic change.

Little, J.T., and Rubin. R.B. (1987). Statistical analysis with missing data. New York: Wiley.

Lumsden, J. and MacKay, L. (2006). How does personality affect trust in B2C e-commerce? *Proceedings of the international conference on electronic commerce*, 471-481.

Lui, T., Piccoli, G. and Ives, B. (2007). Marketing strategies in virtual worlds. *The DATA BASE for Advances in Information Systems*, 77–80.

Lusted, M.A. (2011). Social Networking: Myspace, Facebook and Twitter. Edina: ABDO Publishing Company.

Magretta, J. (2002). Why business models matter. *Harvard Business Review*, 86-92.

Malaby, T. (2006). Parlaying Value: Capital in and beyond Virtual Worlds, *Games and Culture*, 141-162.

Malhotra, N.K. (1999). Marketing Research: An applied orientation. Upper Saddle River: Prentice Hall.

Mäntymäki, M. and Salo, J. (2011). Teenagers in social virtual worlds: Continuous use and purchasing behavior in Habbo Hotel. *Computers in Human Behavior*, 2088–2097.

Mayer, R.C., Davis, J.H. and Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review*: 709-734.

Messinger, P.R., Stroulia, E., and Lyons, K. (2008). A Typology of Virtual Worlds: Historical Overview and Future Directions. *Journal of Virtual Worlds Research*, 1-18

Mennecke, B. E., McNeil, D., Roche, E. M., Bray, D. A., Townsend, A. M., and Lester, J. (2008). Second life and other virtual worlds: A roadmap for research. *Communications of the Association for Information Systems*, 371–388.

McKnight, D.H. and Chervany, N.L. (2002). What trust means in e-commerce customer relationships: An interdisciplinary conceptual typology. *International Journal of Electronic Commerce*, 35-59.

McKnight, D.H., Cummings, L.L. and Chervany, N.L. (1998). Initial trust in new organizational relationships. *Academy of Management Review*, 473-490.

McKnight, D.H., Choudhury, V. and Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative model typology. *Information Systems Research*, 334-359.

Miles, M.B., and Huberman, A.M. (1994). Qualitative data analysis. Thousand Oaks: Sage.

- Moorman, C., Dashphande, R. and Zaltman, G. (1993). Factors affecting trust in market research streams. *Journal of Marketing*, 81-101.
- Nelson, P. (1970). Information and consumer behaviour. *Journal of Political Economy*, 311-29.
- Neuman, W.L. (2006). *Social Research Methods: Quantitative and qualitative methods*. London: Pearson.
- Noam, E.M. (2007). The dismal economics of Virtual Worlds. *Association of Computer Machinery*, 106-109.
- Nowak, K. L. and Rauh, C. (2005). The influence of the avatar on online perceptions of anthropomorphism, androgyny, credibility, homophily, and attraction. *Journal of Computer-Mediated Communication*, 153-178.
- Noble, S.M., Griffith, D.A. and Weinberger, M.G. (2005). Consumer derived utilitarian value and channel utilization in a multi-channel retail context. *Journal of Business Research*, 1643-1651.
- Novak, T.P. (2012). Quality of virtual life (QOVL). In D. Mick, S. Pettigrew, C. Pechmann, & J. Ozanne, (Eds.), *Transformative Consumer Research for Personal and Collective Well Being: Reviews and Frontiers*. New York: Taylor and Francis.
- Nurusis, M. (2010). *PASW Statistics 18, statistical procedures companion*. Upper Saddle River: Prentice Hall.
- Oliver, R.L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Decisions*, 460-469.
- Osterwalde, A., Pigneur, Y. and Tucci, C.L. (2005) Clarifying business models: Origins, present and future concept. *Communications of the Association of Information Systems*, 42-53.
- Pallant, J. (2007). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS for Windows*. New York: McGraw Hill.

- Partala, T. (2011). Psychological needs and virtual worlds: Case Second Life. *International Journal of Human Computer Studies*. 787-800.
- Patnasingham, P., Gefen, D. and Pavlou, P.A. (2005). The role of facilitating conditions and institutional trust in electronic markets. *Journal of Electronic Commerce in Organizations*, 69-82.
- Pavlou, P.A. and Gefen, D. (2004). Building effective online marketplaces with effective institution based trust. *Information Systems Research*, 37-59.
- Pavlou, P.A. and Fygenson, M. (2006). Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior. *Management Information Systems Quarterly*, 115-143.
- Pavlou, P.A. and Chellappa, R.K. (2001). The role of perceived privacy and perceived security in the development of trust on electronic commerce transactions. *Special issue of ISR on electronic commerce metrics*. Electronic Publication, Retrieved 25 December 2010 from <http://www-scf.usc.edu/~tis/eBizLab/Papers/secpriv-ist.pdf>
- Pavlou, P.A., Liang, H. and Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective. *Management Information Systems Quarterly*, 105-136.
- Pearce, W.B. (2007). Trust in interpersonal relationships. *Speech Monographs*, 832-835.
- Pence, H.E. (2008). Managing a virtual concert hall in Second Life. *Music Reference Services Quarterly*: 157-160.
- Porter, M.E. (1985). *Competitive Advantage*. New York: Free Press.
- Popper, K. (1935). *Logik der Forschung*. 1. Vienna: Julius Springer Verlag.
- QSR International. (2010). http://www.qsrinternational.com/products_nvivo.aspx (accessed December 15, 2010).

- Qualtrics. Qualtrics. (2010). <http://www.qualtrics.com/> (accessed December 9, 2010).
- Ragin, C.C. (1987). *The comparative method: Moving beyond qualitative and quantitative strategies*. Berkely: University of California Press.
- Rappa, M.A. (2004). The utility business model and the future of computing services. *IBM Systems Journal*, 32-42.
- Rangaswamy, A. and Van Bruggen G.H. (2005). Opportunities and Challenges in Multichannel Marketing: an Introduction to the Special Issue, *Journal of Interactive Marketing*, 5-11.
- Rawstorne, P., Jayasuria, R. and Caputi, P. (2000). Issues in predicting and explaining usage behaviours with the technology acceptance model and the theory of planned behaviour: When use is mandatory. *International conference of information systems*, 37-46.
- Reperes. (2010) Reperes: Passion for research. Retrieved December 10 2010 from http://www.reperes.eu/search_uk.php?search=Research
- Rogers, E.M. (1962). *Diffusion of Innovations*. Glencoe: Free Press.
- Rogers, E.M. (1983). *Diffusion of Innovations*. New York: Free Press.
- Rogers, E.M. (1995). *Diffusion of Innovations*. New York: Free Press.
- Rogers, E.M. (2003). *Diffusion of Innovation*. New York: Simon and Schuster.
- Rotter, J.B. (1971). Generalized expectancies for interpersonal trust. *American Psychologist*, 443-450.
- Rotter, J.B. (1980). Interpersonal trust, trustworthiness and gullibility. *American Psychologist*, 1-7.
- Seungju, H., Han, J.J, Kim, J.D.K. and Kim C. (2013). Connecting users to virtual worlds within MPEG-V standardization. *Signal Processing: Image Communication*, 97-113.
- Schoenbachler, D.D. and Gordon. G.L. (2002). Multi-channel shopping: Understanding what drives channel choice. *Journal of Consumer Marketing*, 42-53.

- Schroder, H. and Zaharia, S. (2012). Linking multi-channel customer behavior with shopping motives: An empirical investigation of a German retailer. *Journal of Retailing and Consumer Services*, 452-468.
- Secher, H.P. (1962) Basic Concepts in Sociology. Contributors: Max Weber. New York: Citadel press.
- Seddon, P.B., Lewis, G.P., Freeman, P. and Shanks. G. (2004). The case for viewing business models as abstractions of strategy. *Communications of the Association for Information Systems*, 427-442.
- Seunga, J. (2011). Leveraging avatars in 3D virtual environments (Second Life) for interactive learning: the moderating role of the behavioral activation system vs. behavioral inhibition system and the mediating role of enjoyment. *Interactive Learning Environments*, 467-486.
- Shapiro, C. and Varian, H. R. (1999), Information Rules, Boston: Harvard Business Press.
- Shapiro, D., Sheppard, B. and Cheraskin, L. (1992). Business on a handshake. *The Negotiations Journal*, 365-378.
- Shelton, A. K. (2010). Defining the lines between virtual and real world purchases: Second Life sells, but who is buying? *Computers in Human Behavior*, 1223–1227.
- Shen, J. and Eder, L.B. (2009). Exploring Intentions to Use Virtual Worlds for Business, *Journal of Electronic Commerce Research*, 94–103.
- Simon, H.A. (1956). Rational choice and the structure of the environment. *Psychological Review*, 129-138.
- SL Actions (2012). 2012. Retrieved August 15 2012 from www.slactions.org/2012/?page_id=2
- Small, M.L. (2009). How many cases do I need?: On science and the logic of case selection in field-based research.” *Ethnography*, 5-38.

- Steinfeld, C., de Wilt, D., Adelaar, T., Bruins A., Fielt, E., Hoefsloot, M. Smit, A. Bowman, H. (2000). Leveraging physical and virtual presence in electronic commerce: the role of hybrid approaches in the new economy. *International Telecommunications Society*. Buenos Aires.
- Sun, H. and Zhang, P. (2006). Causal Relationships between Perceived Enjoyment and Perceived Ease of Use: An Alternative Approach. *Journal of the Association for Information Systems*, 618-646.
- Partala T. (2011). Psychological needs and virtual worlds: Case Second Life. *International Journal Human-Computer Studies*, 787–800.
- Tang, F.F. and Xing. X. (2001). Will the growth of multi-channel retailing diminish the pricing efficiency of the web? *Journal of Retailing*, 319-333.
- Tanya, D., Seung-Eun Lee, MacGillivray M. (2012). Understanding factors affecting consumer intention to shop in a virtual world, *Journal of Retailing and Consumer Services*, 613-620.
- Tarde, G. (1890). *Les lois de l'imitation*.
- Tashakori, A. and Teddlie, C. (2002). *Handbook of mixed methods in social and behavioural research*. Thousand Oaks: Sage.
- Teece, D.J. (2010). Business Models, Business Strategy and Innovation. *Long Range Planning*, 172-194.
- Telzrow, M., Meyer, B. and Lenz,. H. (2007). Multi-channel consumer perceptions. *Journal of Electronic Commerce Research*. 18-31.
- Thibaut, P. and Kelley. H. (1959). *The social psychology of books*. New York: Willey.
- Timmers, P. (1998). Business models for electronic markets. *Electronic Markets*. 3-8.
- Turban, E., King, D., Lang, J., Lai, L., Pollard, C., Turban, D.C., Volonino, L. and Seballos, I.C. (2011). *Introduction to Electronic Commerce, Third Edition*, Upper Saddle River: Prentice Hall

Verhagen, T. Feldberg, F., van den Hooff, B. and Meents, S. (2009). Understanding Virtual World Usage: a Multipurpose Model and Empirical Testing. *Proceedings of the Seventeenth European Conference on Information Systems*, 8-10.

Verhagen, T., Feldberg, F., Van den Hoof, B, Meents, S. and Merikivi, J. (2011) Satisfaction with virtual worlds: An integrated model of experiential value. *Information & Management*. 201-207.

Verhagena, T., Feldberga, F., van den Hooffa, B., Meentsa, S. and Merikivib, J. (2012). Understanding users' motivations to engage in virtualworlds: A multipurpose model and empirical testing. *Computers in Human Behavior*, 484–495.

Walczuch, R. and Lundgren, H. (2004). Psychological antecedents of institution based consumer trust in e-retailing. *Information and Management*, 159-177.

Wang, L. and Gordon, P. (2011). Trust and institutions: A multilevel analysis. *The Journal of Socio-Economics*, 583-593.

Wang, Y.D. and Emurian, H.H. (2005). An overview of online trust: concepts, elements and implications. *Computers in Human Behaviour*, 105-125.

Weinhardt, C., Anadvasivam, A., Blau, B. and Stosser, J. (2009). Business models in the service world. Business Models in the Service World. *IEEE IT Professional, Special Issue on Cloud Computing*, 28–33.

Williamson, O.E. (1981). The Economics of Organization: The Transaction Cost Approach. *The American Journal of Sociology*, 87 (3): 548–577

Williamson, O.E. (1991). Calculativeness, trust and economic organization. *Journal of law and economics*, 453-486.

Wu, S. (2007) Virtual goods: The next big business model. Techcrunch. Retrieved from <http://techcrunch.com/2007/06/20/virtual-goods-the-next-big-business-model/>

Yahoo (2009). Geocities closing. 12 5 2009. Retrieved June 9 2010 from
help.yahoo.com/i/us/geocities/close

Yan R., Guo P., Wang J. and Amrouche N. (2011). Product distribution and coordination strategies in a multi-channel context. *Journal of Retailing and Consumer Services*, 19–26.

Yeh, N.C., Lin, J.C.C. and Lu, H.P. (2011). The moderating effect of social roles on user behavior in virtual worlds. *Online Information Review*, 747–769.

Yoon, T.E., Joey F. and George J.F. (2013). Why aren't organizations adopting virtual worlds? *Computers in Human Behavior*, 772–790.

Zhang, J., Farris, P.W., Irwin, J.W., Kushwaha, T., Steenburgh, T.J. and Weitz. B.A. (2010) Crafting integrated multichannel retail strategies. *Journal of Interactive Marketing*, 168-180.

Zhang, X., and Zhang, Q. (2005) Online trust forming mechanism: Approaches and an integrated model. *Advertising Research*, 201-209.

Zhou, Z., Jin, X.L., Vogel, D.R., Fang, Y. and Chen, X. (2011) Individual motivations and demographic differences in social virtual world uses: An exploratory investigation in Second Life *International Journal of Information Management*, 261–271

Zott, C. and Amit. R. (2007). Business model design and the performance of entrepreneurial firms. *Organization Science*, 181-199.

Appendix A: Focus group structure

Focus group questions and prompts, Alex Zarifis: (50 minutes)

(What have been your experiences with VW? (5-10)

i. How many times have you made purchases in a VW? What did you buy? (virtual or real?)

1. Before focusing on VW for retail, what do you think about them in general?

2. What have been your experiences shopping/making transactions in VW. (10-15)

i. How do you feel about shopping in CVEs compared to offline shopping and 2D websites?

ii. What criteria do you consider when purchasing products or services in VW such as second life?

Comparing purchases in 2D and 3D irrespective of the product:

Which process offered the most accurate and useful information? Why?

Which process was the most convenient? Why?

Which process did you trust the most? Why?

(Dislike like)

General questions based on Choudhury and Karahanna 2008.

The primary objective is to develop the variables mentioned while giving the opportunity for new issues. (5 minutes each)

What would you consider were the factors which give VW a Relative Advantage? Or: Why do you use VW instead of the Internet or the offline world? Or: What are VW better at than the 2D Internet. (up to 25th minute)

During the process of purchasing some suggest there are different stages. What stages would you divide your purchasing process into?

i. Which channel would you use for each stage you have identified? The retail channels are off line, 2D online and 3D offline (SL). (up to 30th minute)

It has been suggested that the stages of a purchase may be: Requirement determination, vendor selection, purchase and after sales service. For each stage which channel would you use. The channels are offline, 2D online and 3D online. (up to 35th minute)

(High involvement low involvement) Some products are complex and have many parameters, such as car insurance. Some are simple such as a pair of jeans, or a virtual pair of jeans. For a complex product such as insurance would you prefer the 2D or 3D Internet? Why? (up to 40th minute)

Comparing purchases in 2D and 3D irrespective of the product, which process was the richest experience emotionally? Why? (up to 45th minute)

5. Summarize findings (5 minutes, up to 50th minute)

Appendix B: Interview questions

Thank you for offering to take part in this survey. You will be asked a number of questions feel free to ask for clarification if you do not understand the question or anything else you want. When you are ready we will start the interview.

Question 1: Could you tell me your age?

Question 2: Could you tell me your gender?

Question 3: Could you tell me your level of education?

Question 4: Please tell me how long you've been using Second Life?

Question 5: What is your opinion about SL in general? What do you use SL for, for example, how often do you visit SL, how long do you spend there and what do you do there.

Follow up questions if necessary to clarify or extend reply.

Question 6: What have been your experiences in shopping in SL? If you want you can tell me your opinion, or a story of what happened.

Follow up questions if necessary to clarify or extend reply.

Question 7: For the rest of the questions I would like you to try to think of SL as a channel to purchase things, compared to the 2D Internet and offline. Which process do you think gives you the most accurate information?

Follow up questions if necessary to clarify or extend reply.

Question 8: Again, if you could contrast the real world, 2D navigation websites and SL for a purchase. Which do you consider most convenient?

Follow up questions if necessary to clarify or extend reply.

Question 9: Comparing purchasing things in the three channels, offline, 2D navigation websites and SL, which did you trust the most?

Follow up questions if necessary to clarify or extend reply.

Question 10: Is there anything that is, or could be, better about purchasing in SL compared to a 2D navigation website?

Follow up questions if necessary to clarify or extend reply.

Question 11: It has been suggested that during the purchasing process there are four stages: Requirements determination, vendor selection, purchase and after sales service. If these fit your behaviour which channel would you prefer for each one? Out of offline, 2D and SL.

Follow up questions if necessary to clarify or extend reply.

Question 12: There are two types of products, simple ones, like a book and complex ones like say

house insurance. A simple product is standardised, it is the same wherever you buy it from. A complex product may need negotiation and customising. For a simple product like a book which channel would you prefer?

Follow up questions if necessary to clarify or extend reply.

Question 13: For a complex product like house insurance which channel would you prefer and why? The channels are SL, 2D navigation websites and offline.

Follow up questions if necessary to clarify or extend reply.

Question 14: Comparing purchases in 2D and SL which purchase was the richest emotionally and why?

Follow up questions if necessary to clarify or extend reply.

Optional question: Thank you for your participation. Is there something you would like to add on the issues discussed or on any other issue?

Follow up questions if necessary to clarify or extend reply.

Thank you for your participation. Your views are very useful to us. You will receive your payment in the next couple of days.

Appendix C: Survey questions

Survey questions directly exported from Qualtrics survey system. Anonymity was ensured by using Qualtrics to deliver the survey over the internet. No participants' personal details were stored. The questions are presented as they appeared online.

Dear participant,

Thank you for offering to share your opinions. This research is important because it will inform people about Virtual Worlds. Your contribution is important because we want as wide a range of replies as possible and this is your opportunity to share your opinions with us.

The survey has three sections and at the end of each one you change page. Once you move to the next page you cannot move back so make sure you are happy with your responses before moving forward!

What is your real life age?

- ☐ Under 18
- ☐ 18 to 24
- ☐ 25 to 34
- ☐ 35 to 44
- ☐ 45 to 54
- ☐ 55 to 64
- ☐ 65 or over

What is the age your avatar appears to be in Second Life?

(If you have more than one answer for the one you use the most)

- ☐ Under 18

- ☐ 18 to 24
- ☐ 25 to 34
- ☐ 35 to 44
- ☐ 45 to 54
- ☐ 55 to 64
- ☐ 65 or over
- ☐ Don't know / does not apply

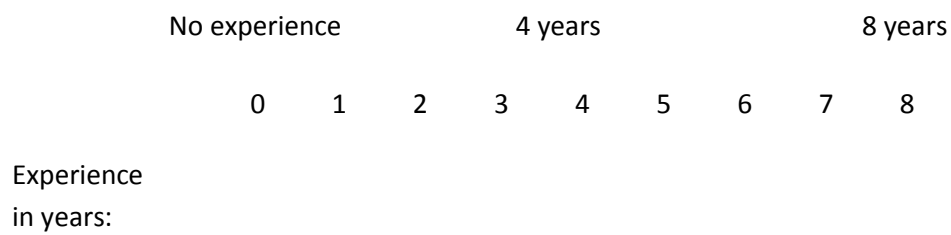
What do you consider yourself to be?

- ☐ Male
- ☐ Female
- ☐ Other

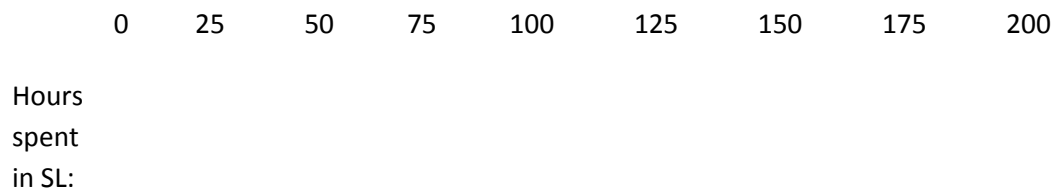
What do you consider your Second Life gender to be?

- ☐ Male
- ☐ Female
- ☐ Other

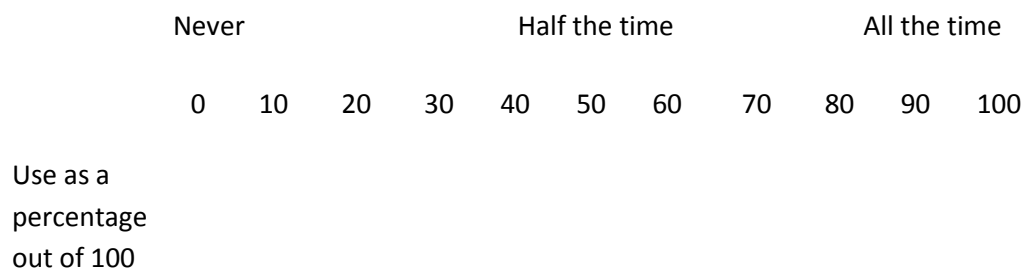
How long have you been using Second Life (SL)?



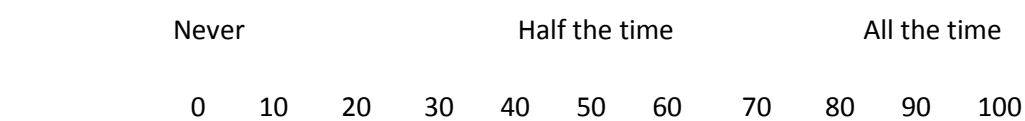
How many hours a month do you spend in Second Life (SL)?



How often do you use Second Life (SL) for Work?



How often do you use Second Life (SL) for Socialising?



Never				Half the time				All the time			
0	10	20	30	40	50	60	70	80	90	100	

Use as a
percentage
out of 100

How often do you use Second Life (SL) for being creative, buildings, avatars etc.?

Never				Half the time				All the time			
0	10	20	30	40	50	60	70	80	90	100	

Use as a
percentage
out of 100

Have you made purchases of virtual world products in SL? (for example clothes for an avatar)

- ☐ Yes
- ☐ No

Thinking about purchasing virtual products in SL, please tell us how much you agree or disagree with the following statement: For me, purchasing virtual products in SL was a positive experience.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement:

Have you made purchases of real world products in SL? (for example clothes for your real body)

☐ Yes

☐ No

Thinking about purchasing real products in SL, please tell us how much you agree or disagree with the following statement: For me, purchasing real world products from SL was a positive experience.

Disagree strongly				Neither			Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50

Degree of
agreement

Section 1 (1st of 3)

Please think now about buying products from 3D stores in Virtual Worlds with 3D navigation, e.g., a store in SL.

The following statements and questions are about what is important to you when purchasing in SL:

For me, the brand also existing offline is important.

Disagree strongly				Neither			Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50

Degree of
agreement

For me, the owner of the shop being famous within SL is important.

Disagree strongly				Neither			Agree strongly			
-------------------	--	--	--	---------	--	--	----------------	--	--	--

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

For me, access to a shopping assistant is important.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

For me, access to the person who created what I am purchasing is important.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

When buying virtual products I want them to be presented in 3D.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

Getting cheap products is important to me.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

I like a shop to be in a popular area.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

I like a shop to be near other interesting shops.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

I like the store to be busy with many people walking around.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

When I am shopping I do not like shopping assistants being in there.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

Section 2 (2nd of 3)

Please think now about buying products from three different kinds of stores.

real world physical stores

2D stores, e.g., Amazon, with no real world presence and 2D navigation

3D stores in Virtual Worlds with 3D navigation, e.g., store in SL

The following questions ask you to think about the three experiences.

I would learn all I need to know about a product from this channel.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Offline

Online 2D
navigation
website

Second
Life

I would find it convenient to purchase car insurance from this channel.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

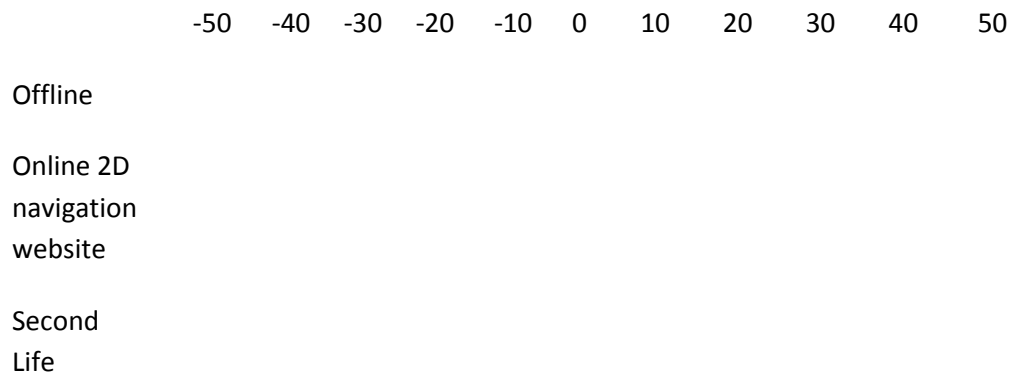
Offline

Online 2D
navigation
website

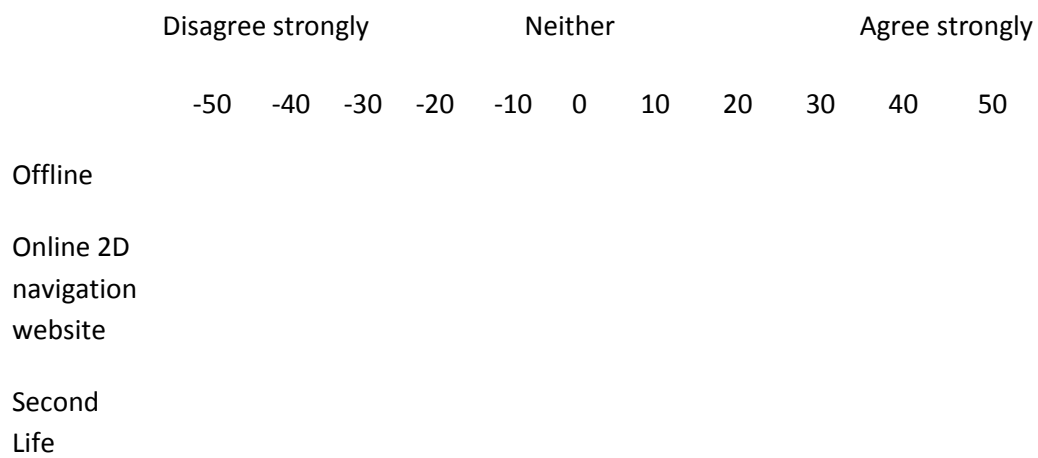
Second
Life

I would find it convenient to purchase a book from this channel.

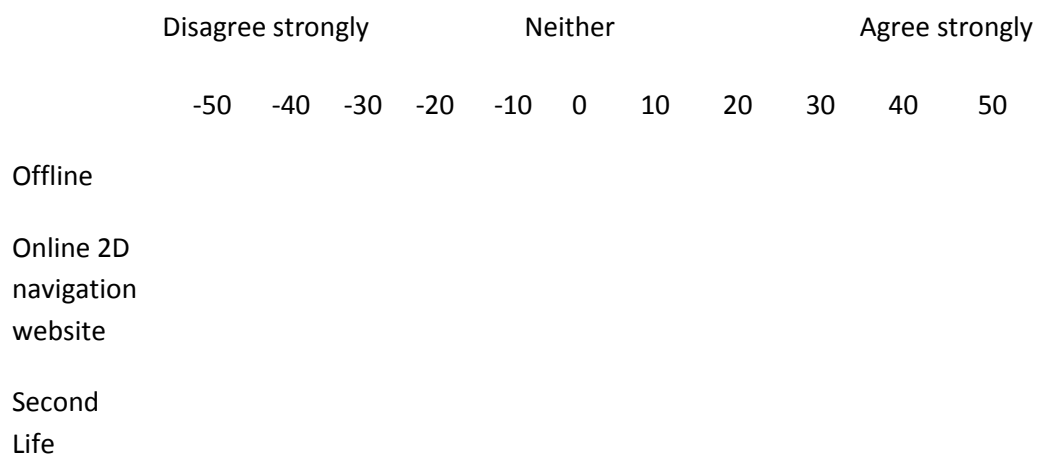
Disagree strongly				Neither				Agree strongly			
-------------------	--	--	--	---------	--	--	--	----------------	--	--	--



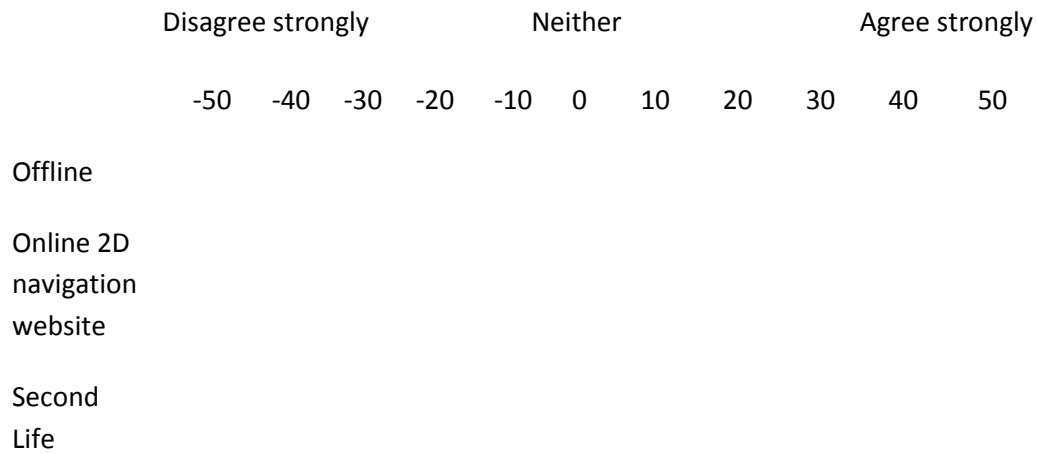
I would feel confident purchasing the car insurance policy through this channel.



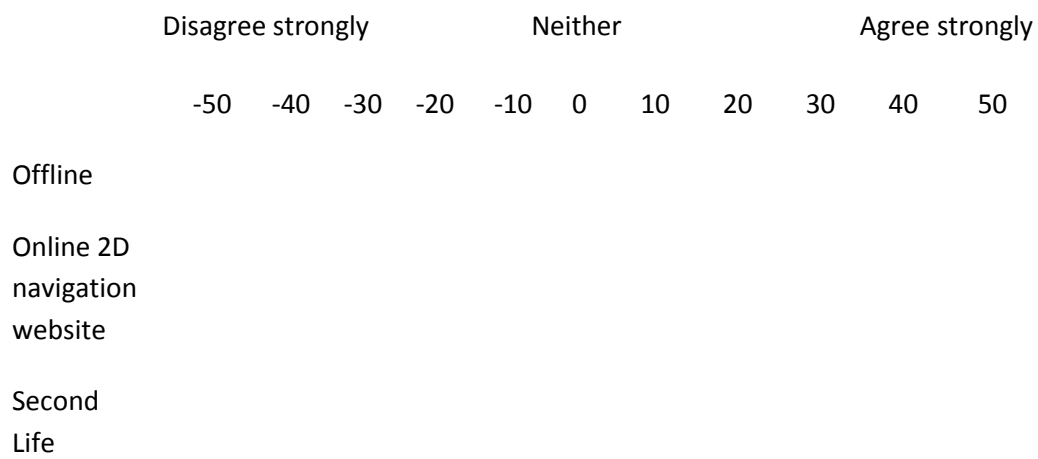
I would feel confident purchasing a book through this channel.



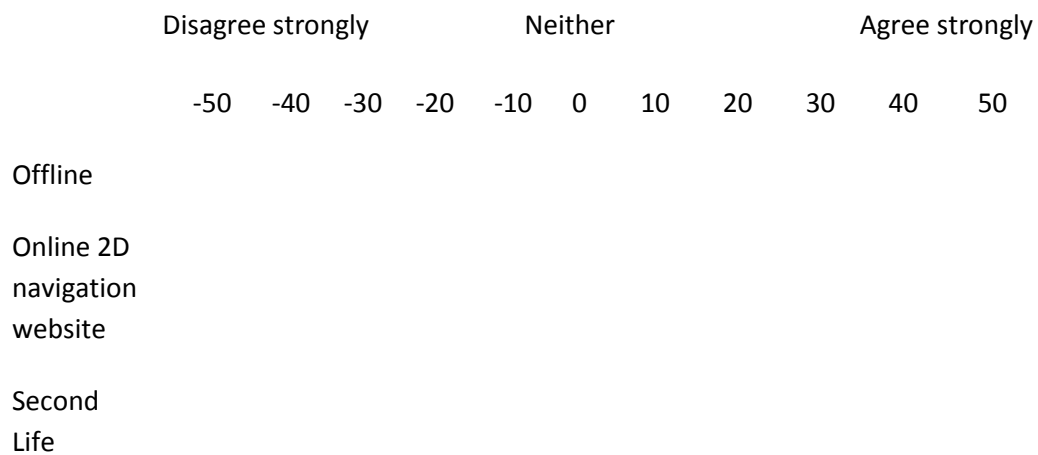
To determine what I want to buy I like using this channel.



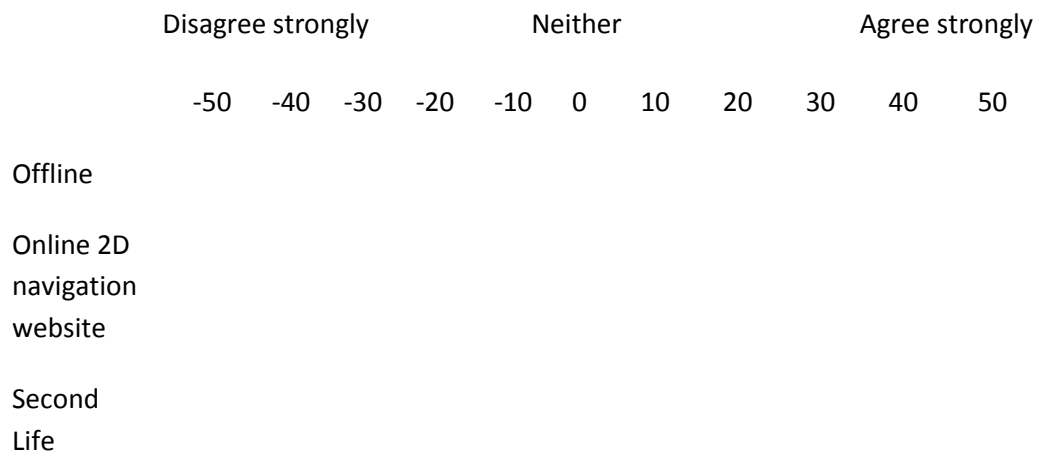
To purchase a product I like using this channel.



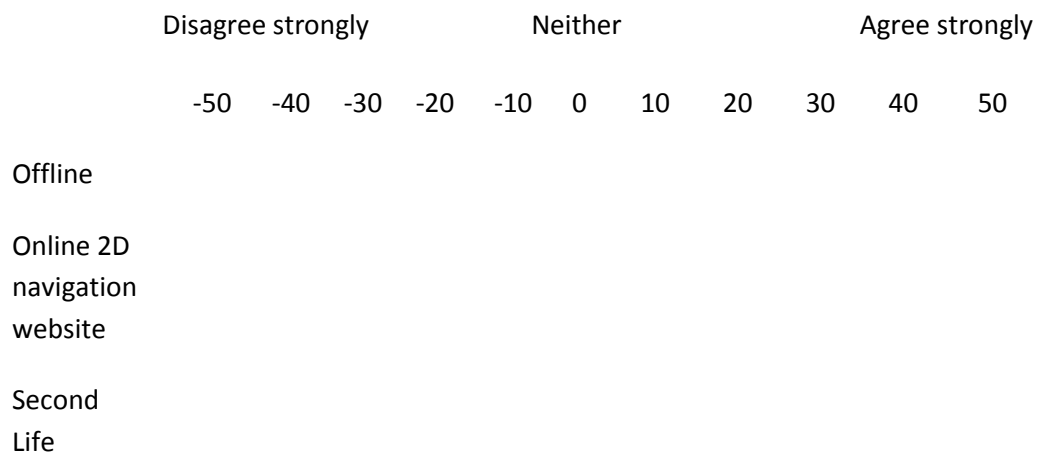
For after sales service I like using this channel.



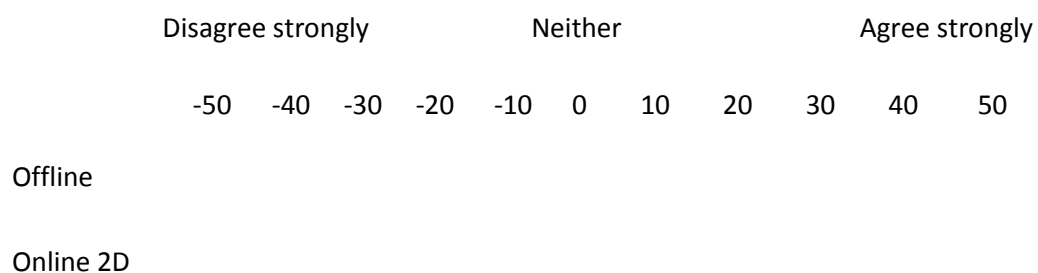
For a simple product that is always the same and does not involve contracts and negotiation such as a book I would use this channel.

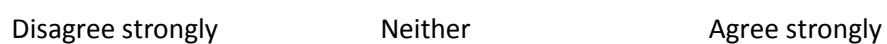
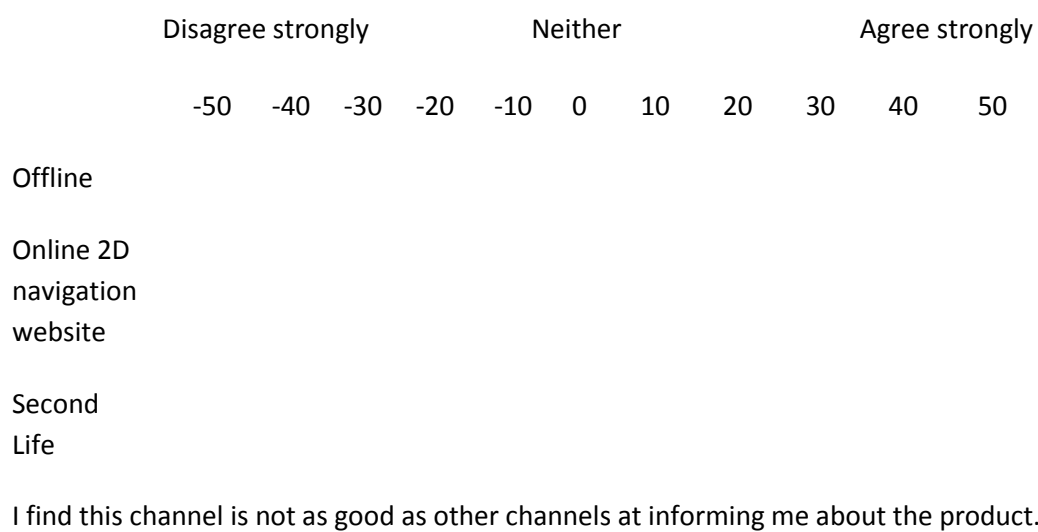
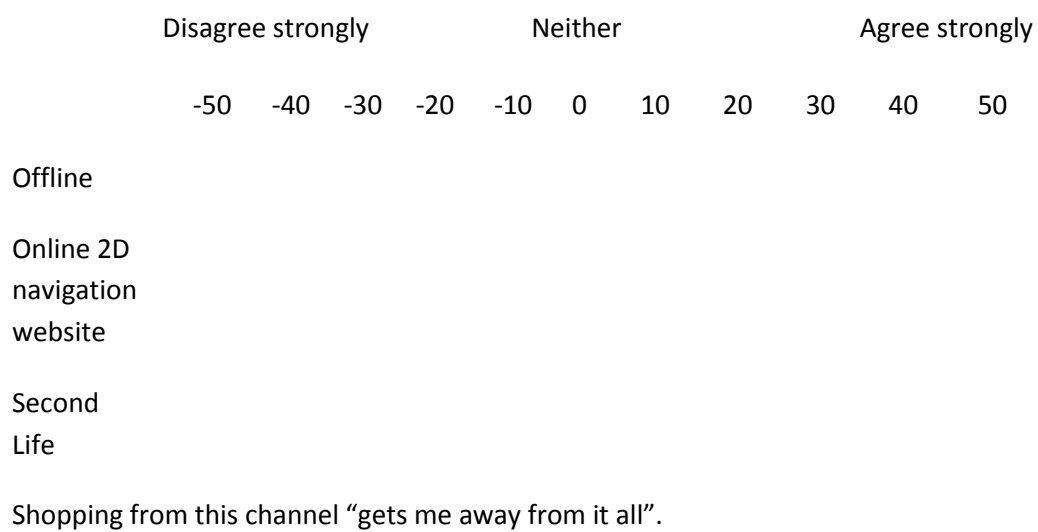
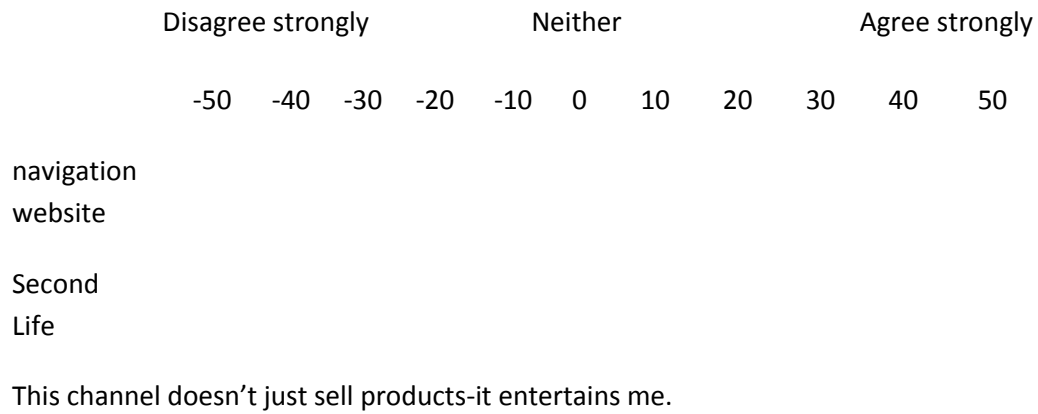


For a complex product that is not always the same and may need negotiation such as car insurance, I would prefer this channel.



I enjoy shopping on this channel for its own sake, not just for the items I may have purchased.





-50 -40 -30 -20 -10 0 10 20 30 40 50

Offline

Online 2D
navigation
website

Second
Life

Section 3 (Final section! Almost there!)

The following questions ask you whether you agree with the given statement on the advantages of Second Life compared to one of the other two channels.

A relative advantage of shopping in SL compared to offline shopping is that I can do it with my friends so it is more sociable.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

A relative advantage of shopping in SL compared to a 2D navigation website is that I can do it with my friends so it is more sociable.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

A relative advantage of shopping in SL compared to offline shopping is that there is a shop assistant and you can talk to them 'face to face'.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

A relative advantage of shopping in SL compared to a 2D navigation website is that there is a shop assistant and you can talk to them 'face to face'.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL compared to offline shopping is the convenience and speed.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL compared to a 2D navigation website is the convenience and speed.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL is the payment method which is easy to use compared to offline shopping.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL is the payment method which is easy to use compared to a 2D navigation website.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

agreement

A relative advantage of shopping in SL is the payment method which is safe compared to offline shopping.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

A relative advantage of shopping in SL is the payment method which is safe compared to a 2D navigation website.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

A relative advantage of shopping in SL is the after sales service which is good compared to offline shopping.

Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

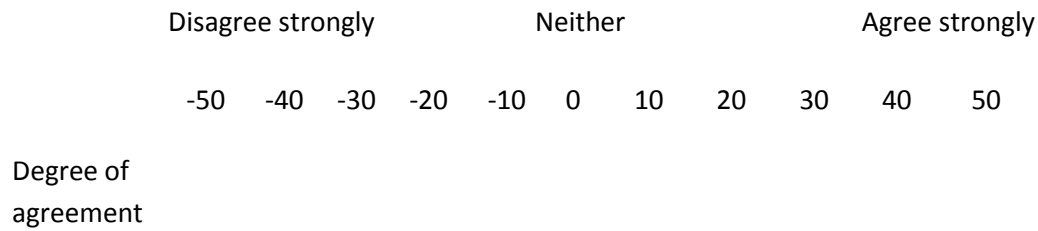
Degree of
agreement

A relative advantage of shopping in SL is the after sales service which is good compared to a 2D navigation website.

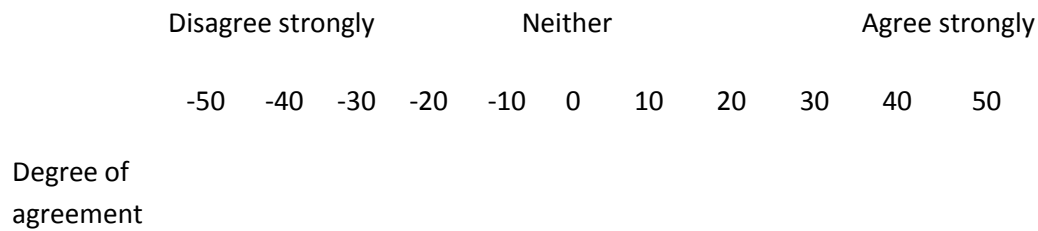
Disagree strongly				Neither				Agree strongly			
-50	-40	-30	-20	-10	0	10	20	30	40	50	

Degree of
agreement

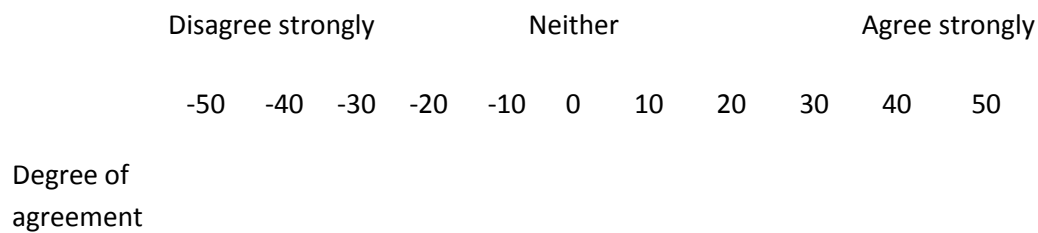
A relative advantage of shopping in SL compared to offline shopping is the way you navigate the world as it enhances the browsing experience.



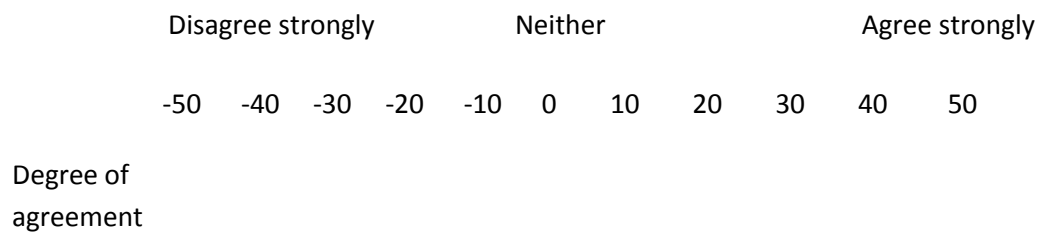
A relative advantage of shopping in SL compared to a 2D navigation website is the way you navigate the world as it enhances the browsing experience.



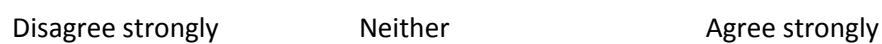
A relative advantage of shopping in SL compared to offline shopping is that good stores are located near each other.



A relative advantage of shopping in SL compared to a 2D navigation website is that good stores are located near each other.



A relative advantage of shopping in SL compared to offline shopping is that I can become something I am not in real life, reinvent myself.



-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL compared to a 2D navigation website is that I can become something I am not in real life, reinvent myself.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL compared to offline shopping is that I can purchase virtual versions of real life products at a much lower price.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL compared to a 2D navigation website is that I can purchase virtual versions of real life products at a much lower price.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL compared to offline shopping is that I can purchase virtual product that are instantly delivered.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

A relative advantage of shopping in SL compared to a 2D navigation website is that I can purchase virtual product that are instantly delivered.

Disagree strongly Neither Agree strongly

-50 -40 -30 -20 -10 0 10 20 30 40 50

Degree of
agreement

You have answered all the questions! If you have additional comments about your experience in Second Life, 2D websites and offline that have not been addressed in the survey and you would like to share, please enter them below:

Please enter you avatar's full name so you can be paid!

We sincerely appreciate your honest opinion and we will try to represent it in our research results.

[Click to next page to submit survey](#)

Appendix D: Focus group data

'D' means different person, where the persons voice could be identified a code was used.

Round 2 Focus group 1

A: OK to start off can everyone say their name.

H: Hi everyone, my name is -, do you want to say something about ourselves?

A: Ok, yes...

H: OK...

A: If you want to say a little about what you are studying.

H: I'm a sociology student, first year,

R: Hi, I'm - and I'm a master student in ~classics

C: Hi I am - I am doing a master in ~c

J: Hi my name - I am MSc student for material science.

Ci: Hi I am - I'm doing a PhD in psychology.

Ha: Hi I am - and I'm doing an MSc in the methodology of science.

Ca: Hi I'm - and I just graduated from a degree in Spanish.

Hallo I'm ...Mel and I just graduated from doing a degree in Archaeology and Anthropology.

Q.1 What do you think about VW in general?

D: Maybe if I didn't have so many other things to do ~...it is definitely an enjoyment thing and I think you would have to find the time to do it. I think to do it well you would have to spend a lot of time finding all the places you need to know, to get things.

A: So you think it would take some time to get into.2:17

D: Yes

H: I think it will be more interesting if there is more people about because everything seems so lonely, at the moment.

D: It strikes me that it is something people can get quite hooked on...have...and nothing else to do.

A: Talk a bit louder. Would it be something you would be interested in thou?

D: I don't think so not me, but I can see why other people can be interested...

H: Yes.

D: ...I can see why people would be interested.

D: I think I would go on it, I think I could spend a lot of time on it.

H: I think it is a nice way of a, doing online shopping you get the feel of being there in the shops, in the shops instead of just looking at the names of stuff in a two dimensional environment, so I think its mostly ~about having fun.

Q.2 What do you think about VW for retail?

-Are you comparing with something like Amazon where you can actually buy something...

A: Yes exactly so if you were going to buy a book in Amazon, and a book here, or trousers in 2D and here...358

D: But they are virtual trousers

A: Yes, at the moment, you can also buy real products. It is more about the experience of buying something.

D: This looks like more effort, the thing about online shopping is that it is so easy. You just a thing and click buy and it is done, rather than control an avatar, wonder around ~step up, I think it would take longer doing it this way, and getting used to than just ~... around.

A: Yes it probably would...

H: I don't see no benefit you know, it is just like a virtual world you know.

Ha: The other thing is two dimensional sites like Amazon have a picture of the real thing provided a shirt of a pair of trousers a picture usually as you see it in a shop but the graphics in this virtual environment would not permit such a realistic view.

A: Yes they are not, but there are other benefits...

D: But something like a book it does not matter whether you buy it in the 2D or not.

D: Something like furniture would be good, if you want to see the size of something a book or even clothes I suppose isn't going to change much

A: Yes I suppose, so you could arrange it.

D: Like in the space museum where you get a sense of the size.

A: Yes a sense of space.

D: That's what I was thinking.

Q.3 Criteria of purchase?6:13

H: The rating of the person who is selling it, I always look at that, you know the stars that you see.

A: Of the product or the person selling it?

H: No the person how reliable they are. I am talking about something like Ebay.

D: I was going to say~ the price and also in Amazon you read reviews and get to see the ~blurp on the back of the book. You just get more information about it.

D: And also you have to pay delivery fee, so I'd only buy something online if there wasn't the shop in Manchester.

A: Yes it might end up costing more.

D: The idea of chatting is quite good ~you can talk to people that are also in the shop.

D: Yes so you can talk with you~friends.

D: And you can talk with the seller I don't know if you could negotiate prices or something like that.

A: Yes you can talk to a sales person, which is an advantage. Anything else what is you guy's criteria when you buy something?

I: Like we were saying ~...posting and packaging, I would look for the best deal so like Amazon do a packaging deal if you buy so many things the postage is free, it might take longer to arrive but it is free. But some places do charge extortionate amounts for P and P and just for what you are saving you might as well go into town and get it.744

A: OK so if you were going to buy a product in a three dimensional world like these ones what would your criteria be irrespective of the product. Would you have different criteria or the same?

D: Price is still important but I don't think, those graphics as they were give you an ~honest impression of what the product would be. Instead of graphics it would have to be a lot more realistic for me to trust that I am buying something that I really want.

D: Unless it could just come up with a JPEG of what I want how it looks like in real life.

A: Yes well some of them you click on a link and it goes to a website. So you kind of get the best of both worlds

D: Oh yeah.

D: But then you could just get it from the website.

A: Yes there is a place called Xstreet where you can buy virtual products from a 2D website. It is really practical but defeats the purpose in a way.

D: It has games and other things as well so it makes you want to go more on this than a website.

A: Yes retail is a really small part of it, mainly it is for meetings, conferences things like that. So you can have a conference and people from all over the world can meet virtually. It is good for conferences because you can hear a speech and then congregate with people you choose to, to discuss it. It has other things but I am just looking at the retail part. So if you are going to purchase something which process do you think will give you the most accurate and useful information. You have already touched on this.

H: Description?

Q.4 Which channel gave the greatest information efficacy?1008

D: I think they both have the potential to give you the same information. But in the moment Second Life is not doing that at the moment, just comparing it to Amazon that sight is so easy to use, you know exactly where to find everything. Whereas that looks like it is not finished yet.

Ha: I think the 3D would give you more (info)~... say if you want to buy a car for instance, in a 3D environment you get a better sense, a better idea of the size, you can flip it a round to get different views ~...and you could enter the car and look in that regard you get more information.

Q.5 Which channel is more convenient?

D: I thing a normal website ~cos you can just type it in and look at all the products. On that program can you type in a product and see all the different stores that store that product?

A: Well yes, if you type in clothes you get all the stores that sell that which is good because mainly you explore information in a three dimensional way but you also have that option. So you can search for clothes in the category of shopping and you get ranked results.

D: Lets say you wanted a specific book could you type in the author and the title?

A: No it is more about categories than specific products.

D: That would be good if you wanted to browse a particular part of a bookstore and look at different books, but if you want a specific book then just type it into Amazon and it will take you straight to it.

A: So you think it is good for browsing but not good for things you know you already want.

I: I think personally, if this was to compete with 2D shopping it would have to have the same exact perks as when you go to a real store into town so for example you would always expect to find an item of clothing because they stock shelves everyday you would expect to find an item of clothing in Top Shop because they stock the shelves every day. I kind of think they should do this here as well. If you go into a shop to browse for clothes you would have to have the same guarantee that everybody is working in the store and that they are keeping the stock.¹³¹⁴

A: So you are thinking that it has its weaknesses compared to the 2D environment so it is important to do the 3D better, probably as good as the 3D real world.

: I think it needs to compete with the real world shopping, as opposed to the 2D shopping.

D: Yes especially since many people go online to save time and this doesn't really seem like it will save time so it will ~... rather than bothering to go to the shop.

Q.6 Which channel do you trust the most?

D: Probably 2D because that is tried and tested, I mean when that first came out nobody trusted it. So if this became popular over time people would trust it because it would prove that it was reliable.

A: Do you think 2D in general or the specific websites you are used to?

D: I suppose the specific websites because you still get dodgy websites in 2D.

I: You would have to have the same security measures. If it is like it is there I would likely use 2D because I would think is that really ~...because it is like a cartoon isn't it. It is not like a real picture or a real thing. On the Top Shop website there is a picture of the real thing and you can zoom in to get more of an idea of the material and you can zoom out and turn it around and it is the real object, but with that what am I actually buying? Because it looks like it might be quite nice but then...

A: OK, how about, because that is a fair comment, you might be buying a real product in 3D but not actually seeing it. What if you are buying a virtual product in which case you are seeing exactly what you are buying.

I: I don't think that is something I would do.

A: But if you did would you trust it.

I: If I did it probably would not bother me that much because it is only for my little character. I would see what it looked like, I could try it on, on the avatar so yes I would trust that.¹⁵³⁶

A: So you want to see clearly what you are getting. How about the financial side, the transaction part?

D: Well if I buy trousers for my actual character would I pay directly with real money?

A: Well what you do is buy the Second Life currency called Linden dollars with real money and then use that to buy products. There is an exchange rate, like when you would buy Euros. You have that credit in your account and then pay from that account.

D: So do people give real money to buy things for their character?

A: Yes. First you buy Linden dollars and then you use those to buy things in Second Life. It shows the amount of credits in the corner. So there is a virtual trouser if I wanted to buy it I would click like that, it shows the price there, and I click purchase to buy it. Anyone else on the trust issue?

Ha: So do you have a secure location where you buy this currency?

A: Yes, you buy the money directly from the owners of Second Life.

Ha: So you don't have to pay directly for each transaction.

A: No.

D: So the company you buy the products off don't see your bank details. So that would be fine.

Q.7 Relative Advantage of VW?

D: I suppose it is a little bit like a game so it is more enjoyable than just clicking on something like Amazon and buying something, without browsing or doing anything else.¹⁹¹⁷

A: So you think that if it made it more enjoyable that would be the main reason to use it?

D: Yes, if I was into the whole Second Life game kind of thing.

Ha: Also the payment method ~... Is more safe because if the retailer does not have your bank details then ~ you don't have to worry from him.

P: Everything is internalized because you buy the credits and then the credits flow round the system and they get the credits out the other side.

A: Yes that is an advantage.²⁰²⁰

P: I was thinking it could be more sociable, you can't really go with friends around Amazon, but we were saying about conferences and stuff.

, you could go with your friends around the shops.

A: So you could meet together.

D: But I don't think that would be as much fun as getting your friends and going down on a Saturday afternoon and you can go out for lunch.

P: but if they are in a different country?

D: Yes maybe.

I: Sometimes I do send a link to my friends, and I will say do you like this top? From Top Shop or say Ebay so I suppose you can do that to a level, but you can't move around.

D: Well I suppose people that make online friends, that is a way for making online friends, and then you could shop with them which you would not know otherwise.

Q.8 What are the purchasing stages?

I: Do you mean from the very beginning? So the stages in choosing the item?

A: Yes from the beginning.

I: Well I suppose looking for it, choosing the item and then, do you mean online?

A: In general, from the beginning.

Well I suppose just browsing and if you want it just get it and getting things in your basket which you can do in a real shop or in the internet. Once you have decided you want it.

A: Would you know what you were looking for at the beginning or?

D: Maybe you would have a vague idea, oh I want a new t-shirt but you wouldn't know what kind of t-shirt you wanted, and just go look thru loads of different t-shirts and also when I shop online I put everything in my basket that I think is nice and then at the end I look at my budget and think of I can only spend 30 quid and I delete most of it and then I categorize what things I want most and stuff.

I: And you do that in a real shop as well you try things on and decide which ones you look the best in and then discard the rest. And asking people's opinions which you can do on something like that and in a real shop but not really in a 2D website.2327

A: Any other ideas about the stages in the purchase process? I know that if you have not thought of it before it is hard to break it down...OK great so if we try to break down the stages you suggested, firstly you have a vague idea of what you want, then you browse and find something you like and then you see if you can afford it and then you buy it.

D: Yes

I: Yes

Q.8B Best channel for each stage?

D: Probably a normal website because you can just type it in and it will come up with all your options where as in a shop you have to go round the whole shop and in Second Life it is the same you have to go round the whole shop. So say you wanted a t-shirt, they don't categorize them and say this is the section for t-shirts do you know what I mean.

A: So what do you guys think?

Hu: I think 2D. 2D is the best, better than the shops too.

D: Say you are looking for something specific, say a t-shirt, all the t-shirt are in the same place, whereas if you do not have a clear idea of what you want just browsing round a shop would be better, and then there is no limit to how many things you can try, whereas on a website there is a limit to how many things you can order and send them back if you don't want them.2532

A: OK great, so then the next stage is thinking if you can afford these things you like. Again from the three channels which do you think is the best.

D: Maybe Second Life because it has your things in the corner and it tells you how much money you have.

D: And you can also add some more.

D: But maybe you would feel guilty putting more money in ~... bought something, do you know what I mean.

D: I think it could kind of benefit you because you would decide, I am only putting £50 in the account, promise I will not put any more so you can browse with that £50 and make sure that is the only amount you will spend ~... more than you should.

D: But that involves you spending pounds to buy the credits on here, whereas in a shop you do not have to spend anything if you don't find something you do not want so you still have that £50 in your bank account, if you see what I mean.2638

A: So you are trying to say you have already decided to spend that money if you buy Linden dollars.

D: And I don't know how easy it is turn it back if you don't want to spend it.

D: But when I go into a shop I some times get cash out of the bank and then I have already made the commitment, you might as well spend it so it is sort of the same thing.

A: OK so the last stage you pointed out was the purchase stage. You have decided you can afford it and you are going to buy it, which channel do you think is the best.

I: Well ~... usually you can have an account and your card details are there and you just press a button and it goes to your account. I suppose you can have this here. But also an offline shop gives you the option of paying in cash if you do not want to use your card.

D: Also you get the product instantly if you buy it in a shop.

Ha: There is no time between purchase and receiving the product.

D: Yes.

D: And also the picture however good it is will not be as good as trying it on.

D: Yes, even if you buy something off a website and it comes you can try it on and then if you do not like it you have to go thru the process of sending it back and making sure you get a refund. Whereas in a shop you try it on, if you want it you buy it if you don't you don't buy it.

Q.9 Preferred channel for each stage?

D: I would say for something like a computer it is probably better online because you can then browse lots of different options and have a look at the full specifications of the product.

D: But then the thing with this, or in a real shop, you can go in and then you can talk to someone that knows more about it and say I want, like I don't know anything about computers, so I would go in and say I want a computer, want to watch some films on it, I want some games on it and I want to go on Facebook and maybe the sales person will say well if that is all you want to do then here's this one. But if you are on a website, I don't know what all these terms mean, I'd be lost.

A: So you can tell a specialist your needs and then they can figure out what you should get. Right OK.

D: That means you would have to have the person in the shop every time!

D: Yes.

A: So briefly, vendor selection, so continuing with the computer example if you find that useful. So lets say you have decided on the specifications and you want to decide whether you want to get, say an Acer or an Asus or something else, which channel do you think is best?

Hu: I think the shops would be the best because you get a second opinion from the professionals, the assistants, so I think they just reassure you that its right.

I: They usually have more warrantees and stuff which are bit more guaranteed than something like that. And also you can take it away with you and that is it whereas to get it delivered to your home you would have to wait in for it and wait until it arrives ~and then where does it go.3056

D: But if you buying something big you are paying a delivery fee whether it is on Second Life or an online shop, whereas if you walk into a shop and buy something big they will say oh the delivery fee is £30 for this fridge, like it seems like I am paying it anyway so, it just seems like on this well I am paying anyway so I will get it delivered, whereas in a shop you would not know what to do because you would have to pay extra.

A: They would add it on at the end.

Yes.

A: OK so now lets move on to the after sales service. If you want to continue with the example of the PC and say you have technical problems, which way would you feel comfortable going back to the person that sold it to you? On the website in the shop or in the 3D shop?

D: In the shop. D: In the shop.

I: Yes in the shop.

A: OK so lets say the shop is best. Between the 2D and the 3D which do you prefer?

I suppose 2D because you would just email them, whereas in Second Life I am not sure how you would go about that if you had a problem.

D: If you wanted to get in touch with them they might not be online when you are online, you might keep on just missing them. And also if someone was scamming you they might not go online again.

D: At least with Amazon the sellers are verified.

Q.10 For a complex product would you prefer the 2D or the 3D environment?3240

I: 2D websites are great because you can use comparison websites from independent people.

A: We are talking about something that is not standardised so the comparison websites may not cover that completely.

D: So it is tailored to the individual.

I: In the comparison websites you can type in say, what your occupation was and all the rest of it and it tailors it for you, say you were a student it would find all the places that would do a student loan, ~... you would be allowed to pay it back over a number of years, so you give all the specifications and then it comes with a list of all the options. Like for car insurance you type in your age and how long you are driving and the type of car you have got and then it comes up with a list of companies and the different insurance quotes are and then you can go direct to those websites.

A: OK so you prefer that to a 3D environment.

And in the real world you have to go into each place individually and discuss with them what your needs are and it would be a bit cumbersome, I think.

D: I think if Second Life could guarantee that you could talk to a real person from a company that you know online then there would be the temptation there because you can avoid having to walk to different places downtown to get insurance around town you could speak to somebody, say from the 2D world you could get a list of places and then you could go on this.3548

D: Yes maybe you could use them in conjunction.

D: Yes I think you could use them in conjunction. If you could guarantee a salesperson with the company you want to go with, so you could negotiate, that would be a benefit. ~...

A: So you want to get the good things from the real world and those of the internet, like it being faster.

I: It would have to be really secure thou. If you were just typing in to a website and it was a virtual world like this you would have to say who am I talking to because I can't actually see them.

S: It would really have to completely guarantee the security for me at least, probably for everybody you would have to know who they are, say you were speaking from somebody from Tesco car insurance or something like that, that would guarantee my security.

Q.11 What would you buy in VW?3650

D: Large products, furniture, fridges things like that. Computers...

D: Or things that you don't need to know what they look like. Like, I don't see myself buying jeans on a place like this when you can't see clearly what they look like. You can't see it properly. So yes books something like that that you're reading it, or a DVD, but not clothes.

I: Unless it literally resembled the inside of a Gap store or something like that and there were actually pictures of the things, the things hanging up were actually stock, but I think that is some kind of upkeep to maintain a website like that, but you would want to feel like you were actually wondering round the shop.

D: It would have to be like a webcam thing and then you would be able ~...to come to the object to see the products.

I: Yes, hahaha.

Ha: They would have to have links on every item of clothing and when you click on it it shows you a picture. It would ~...

I: Even then it wouldn't have an advantage over 2D, because they have ~...pictures already.3835

Hu: Yes.

Q.12 Which environment is the richest emotionally?

D: This one.

Hu: Yes definitely, this one.

A: OK, why do you think?

D: It is more fun and it is more like you are really there!

Ha: Yes it is more interactive, I guess, you control your avatar, you walk into the shop you walk around, you can fly if you get bored. I think it is more fun.

Hu: Yes. D: Yes.

A: OK great, thank you for that, now we just have to sort out the paper work and the payment and I can let you go.

Round 2 Focus group 2

Q.1 What do you think about VW in general?

M: In general so far what I have seen is that from the press it has been hailed as this great innovation and so everyone is on it and it is this weird think that everyone is talking about, but I think it is less popular than people imagined and few people spend thousands of dollars to get there own islands and stuff, but basically I think it is mostly ignored by the mainstream. The thing about it is that if you can do everything there is no real incentive to do it?!137

A: What do you mean?

M: I mean the only people that get off using this are designers or graphic designers who can actually create and actually make a sport out of it but I think other people would get bored by this quite soon.

A: OK.210

M: And then we are so used to the convenience of Amazon and stuff where you can have, where you can very conveniently browse, find things, find related things, find reviews, find out whether you can buy it somewhere else and it just seems so convenient while as this seems like an added, it looks like you are physically going out and buying stuff, but it is just on your computer, but that is the good thing about Amazon, you don't! And this just adds a layer of complexity which is unnecessary.

A: So the browsing and walking around, you think it is extra time?

M: Yes.

A: OK anyone else?

D: One of the downsides of this is trying to get the realism of actually being in the shop but you are not actually in the shop because you can not actually see if any of these products can actually fit your body and how they look on your body.

A:OK, but if it is a virtual product then you would see what it looked like on your avatar, but if it is a real product then yes you cannot try it on.

MB: I see it more as a recreational thing, I do not really see it being used as a serious tool for anything really, yet, maybe in the future. I don't know. And what you see is not real, it is kind of an image of what the product is, I think I would prefer to have a real image of whatever it was I was buying.

349

Fr: It would be interesting maybe, if it had real places like museums and stuff and this can also have some social utility in the sense that maybe disabled people would be able to visit virtual events.

A: So you would like it to be completely realistic.Fr: Yes.

M: Basically we need Google to come in and do Google Street view, Google world, Google Earth, Google 3D and I just think maybe you could walk thru it and just look at stuff.

A: There is another Virtual World which does that, they took pictures of the whole of Berlin and they made the whole city centre and you walk around.

M: Google Earth isn't it?

A: No it is a virtual world, you walk around, you have an avatar.

M: Oh ok, never heard of it.

Fr: That would be nice, I mean for me to see a fake museum, and get the clear impression that nothing is real.

M: I would rather see a documentary than walking thru some...

Fr: Yes.

D: Also this is a, as we said it adds another layer of complexity doesn't it, people that are quite busy might just go to the website ~... they might not want to go thru a channel like this because it takes much longer to actually get to what they are looking for.

Q.2 What do you think about VW for retail?537

D: It depends what you are buying, If you are buying a CD then yes it is ok then, it is easy to go online and get something, like CDs or videos, but if you want to buy clothes it is not so easy, I mean I am usually a medium, so I could buy a medium and it would probably look alright but you don't know. Some things you would have to do offline, you would do it in person.

Fr: In addition, I mean if I am not really buying stuff and I am just virtually buying stuff with this credit it simply feels stupid. I don't really see the point.

M: In Warcraft they play and they spend lots of money on items there.

A: Yes, well so far it is mainly to socialize, it has been mostly used for meetings and conferences. So if you are going to a conference you buy a suit, that is the logic...

Fr: OK.

M: The thing is if for example if Primark or H & M had a virtual thing in there where they had actual clothes that they sell and you could have an actual representation of your physical body in there, thru, it is just that the technology is not there yet, thru scanning your body, like in the shop and then getting your ID and going back to the computer and do it and then you can actually try clothes on and actually see what they would look like because you are not just a semi-human avatar, you are actually yourself out there, or at least it resembles you more closely, and then I can see how that would be very, very useful, and also for example, just sort of a tangent how driving simulators have become more and more realistic in that way in that people can say that the feel of driving each car actually differs for each car, so actually a car retailer can have a very, very powerful simulator where people can try out and actually find out how the car actually feels like to drive!

A: Yes there is one like that but it is not that great.

M: Yes it is not there yet, it still needs like ten more years.⁸⁰⁸

Q.3 Criteria of purchase?

D: ~... The reviews, from the customers and the price.

M: I am never really fond of that because if you buy online from a proper place, you usually have more than one picture so you can get a proper understanding of the physical dimensions of what you are buying thru 2D, so...it is not really...⁹⁰⁶

A: OK, so what are your criteria when you will get something? If it helps you, you can continue thinking of the clothes example. Let's start with a 2D world...is it price or something else?

M: I don't really buy clothes online.

Fr: Yes, I never buy clothes online.

A: OK, you can think of something you do buy, say books or a computer.

M: Then you just look at the specifications; I mean you know what a book looks like, it is just the author and the title and whether you have heard it is good or not, the synopsis and that and you can have that without 3D.

A: So you are saying that you know what you want and you just want to get it. You are not interested in...

D: Well it depends what it is, I mean a book is the same whether you buy it from shop X or shop Y, it is exactly the same, but if you are going to buy something technological like a computer you can take more things into account for example the brand name and reputation, and then the price as well.

Fr: But in that case I would go first to some physical retailer, talk to someone, be able to go to Amazon and then buy it!

A: Oh OK.

MB: I think Amazon have this cool feature where they suggest things you might need, you know when you buy a camera, you might need this, I like that, I think that is quite nice, because you might need to get say the memory card, and that might be quite useful.

A: They suggested to me to get a moustache trimmer and a Leonard Cohen CD, I am not sure what that says about me!

D: It is not perfect!

M: But that is just because someone that bought what you bought, also bought those things.

Q.4 Which channel gave the greatest information efficacy?¹¹²¹

Fr: It is nice to be able to interact with someone in this world. It can give you information. But if I have to wait for the person and they are not there I will call the customer service.

A: So when there is a sales person there you appreciate it.

Fr: Yes that is nice.

M: I don't really see the advantage of having a sales person as an avatar there though. For example I am a magician, I do magic tricks and there is a magic site in America where there are people, who you can chat live with, which know all the items and they can give you tips.

A: On the website?

M: Yes, and I think just having a spec sheet of anything you buy there and just having information bundled as a whole is a lot better than seeing it, clicking on it, finding out how much it costs, thru which channels it is going to be delivered, finding out all this information thru consecutive steps instead of just in the same place.

A: So you think 2D can offer you this?

M: 2D can offer a more concise...

A: Do you think it is better information since it is all in one place?

M: I think so, unless you were to build this into the 3D world. So for example as in text that appears.

A: Yes.

Fr: And some form of chatting.

A: Some 3D shops have links to websites for more complex things.

M: Yes.

Q.5 Which channel is more convenient?

Fr: Well this 3D to me it just complicates things; it takes ages to buy something very basic when I can go on Amazon three seconds, done.

D: It takes very much longer there if you want to explore, and you have the time. If you just want to get something ~...then Amazon is better.1416

A: So you think it is more an experience than something practical.

D: Yes.

Fr: Yes.

D: Yes, definitely.

M: Also I think it is a bit weird to think about this as 3D because it is only a 3D representation on a 2D surface, so I think it would be a different think if we could actually see it in 3D because we are just inferring 3D from our own knowledge of perspective and how things move around when we move to each other. If we had real 3D I think that would be different.1427

D: I think, I don't think, in order for this to be really practical and to have an advantage as a technology ~... it is trying to create a 3D environment on essentially a 2D form that being on a screen on the computer and I really do feel that you have to experience it as if you really are in that room. I think then you will get far more interest.

Q.6 Which channel do you trust the most?

Fr: I don't see any difference, beside of the fact that you use credits so they do not get your bank account details, or whatever that may be convenient, even if these details have already been given in an earlier stage to acquire these credits.1638

M: What is Paypall for? I think it goes by experience and reputation, we know Amazon is reliable in shipping things so we trust Amazon, but if this, or anything else that has a 3D interface lifts off and be as successful then why would you not trust it as well.

A: I suppose it would be a better question to ask if you would trust Amazon more if it was 2D or 3D.

M: I don't think it would make a difference. Because if you think about it logically it is just a different interface. The people who send it, it is the same process. Because in the end, after you have clicked on buy it is the same process.

A: OK lets try it another way, a stranger in 2D, a company or a person that you do not know, compared to 3D?

M: Well that comes down to how much security is built into the system, for example I trust the Amazon marketplace because I know that Amazon has built into its systems security features that prevent people from screwing you over and if there was something built into the 3D system then yes, why not.

Q.7 Relative Advantage of VW?

Fr: About shopping or in general?

A: If you want to say something general you can.

Fr: Again it is the same part of the story I think if someone is unable to move maybe has this kind of feeling that they are living a normal life.

D: If you don't want to leave the house and you can't be bothered to go shopping then it is easier to do so I suppose that is an advantage.

M: If you go out in Manchester you just have a limited choice of shops, while as if you try to teleport to any location then you can try to find people who sell Swiss cheese, and there is not Swiss cheese person here in Manchester, I think. So I think it is the amount of choice it has and also if they were successful it would kind of give, I think what would need to happen to this in order for it to be successful is some sort of, some kind of, give the power to the masses, like Youtube!?! Web 2.0 web content by the users, which this is, so more people make their own shops, so if this is successful and people sell the stuff they have been making for 20 years very specialised, they do it in their own home

and once they make a little profit they will be able to compete, while as if they had to buy real shelf space or a real shop somewhere because you do not draw in enough people but if you have worldwide customers then maybe you can sell some stuff then maybe it opens up new opportunities for smaller companies.

A: So they can bypass the retailer.

M: Yes, in the same way that digital downloads allow people to program small video games, with just a couple of people, which is a new trend in video games. Usually it was just you went out and you buy a game and they only had so much shelf space and only the big block buster titles can be sold and be successful. Now you can download small games, so they have a chance to be successful as well.

Q.8 What are the purchasing stages?

MB: Well if it is clothes. I tend to like to try them on first, to see if it fits, then the second stage would be buying it, if I like it or just leaving it there and then carry on shopping, I think that is part of the pleasure of the experience. But for anything else it is different, so like CDs I would compare the price

M: Another nice thing that an online retailer has a shopping cart it is like an intermediate step between liking something and buying it and when you are done browsing you go to your shopping cart, you review your items which is another step and then you say ok I want to buy it and then there is another couple of steps, billing address, shipping address, your payment details and another review of the terms and conditions and then you finally buy it.

Fr: For me, I am a kind of old style consumer buying from the internet requires the additional step of going to the physical retailer and physically seeing the thing in front of me and then I buy from the internet if I have an advantage of price.²³¹⁵

Q.8B Best channel for each stage?

Fr: Just trying something on, no personal opinion.

M: It depends on the level of realism, because now, the trousers look like 2D objects, just a picture of them, whereas a real picture on ebay would give a better feel for the item even if it is clothes so, it is also that this needs to work on old computers as well, but if it were to work on a really powerful computer it would look, good graphics and proper representation of your body then this would have an advantage over 2D.²⁴⁵⁶

Fr: For example I think that the real colour of the item cannot be replicated in an easy way so, I really prefer the picture on the Amazon website.²⁵¹³

A: OK, moving on to the next stage purchasing, which channel would you prefer and why? For the purchasing stage, when you pay.

D: If you know it was secure then whether it is 2D or 3D it is ok, of course 2D you already know its all in front of you and it is just two steps ~... but if you got that far on a 3D then obviously you, you use the payment system, that thing at the end, the transaction, it does depend how secure the transaction is.

A: You have put all the internet ones together for you they are the same, so how about the real world?

D: I quite like seeing someone, talking to someone when doing something as opposed to a machine, but I know that is quite an old fashioned view to take.

M: The payment, if you go to a shop, in the real world and buy with a credit card it is not really buying in the real world is it? It is not really different than buying from Amazon and putting in your card details, it is not really different. The only difference is that you are physically swiping the credit card, but that does not stop the person defrauding you, any more than Amazon would but you know that it is a big retailer that has the credentials and you can see the encryption, that it is encrypted so ~... it is secure.

MB: But you have the object there in your hands when you buy it and that is what I don't like when you buy things online, because you buy it and then you have to wait and when it comes it might have something wrong with it and you have to send it back, and that is just 'faking' around.

Fr: On the other hand assuming that everything is very secure, data protected and everything, buying from the internet whether it is 2 or 3 dimensional, has the nice visuals, I can do it, even when stores are closed, in the middle of the night I will come and decide to buy myself a new laptop I can do that!

A: That reminds me of a couple of summers ago when there was a heat wave and it was too hot to sleep there was an increase in internet sales.Fr: See!

Q.9 Preferred channel for each stage?

M: Is that the stage is when you actually decide what you want?

A: Well it is requirement determination, so using the example of the laptop, you may have decided you need a laptop but you don't know what kind of laptop. M: OK.

A: So for that stage which environment would you prefer?

M: It depends on what kind of item it is.

A: Lets say for a laptop. 2852

M: For a laptop I think online shopping and not 3D shopping is the best because you don't really need to touch the computer, you just look at the specifications, the screen size, the internal memory thing and then find reviews, and look at price charts and do all these things very easily online, even better than in a real shop, because in a real shop because in a real shop the person you ask might not have the full picture whereas if you go online you can go to different retailers and find out all the different developments and stuff so. But if you do not have enough knowledge about this then going to someone that knows this about this and will tell you do this or do this, that is actually the best because if you, if it is your first laptop, and if my grandmother wants to buy her first computer she doesn't know what, she is not going to go online to research about the computer, the difference between so and so gigabytes and stuff like that, and yes so if it is something you don't actually know about then it is better to go to speak to someone.

A: OK great, so the next stage is vendor selection. So let's say you have decided exactly what you want a laptop with this processor with this memory this processor and you want to decide which vendor to buy it from, whether it will be from Comet, Currys or Amazon for example. For that stage which environment would you prefer?

Fr: The internet in general, whether it is two or three dimensional I don't think it makes a huge difference, the internet simply because I don't have to, now that I decided the type of the laptop and everything I do not have to move physically so I can easily compare ten twenty different stores, and that is it but whether it is two or three dimensional I really do not see the differences. I do not think I will enjoy flying from one store to the other, on the other hand if it does not take ages to upload the store and everything it is also fine to fly from store to store, I really do not see the difference, what can I say.

M: It boils down to whether I need it, how quickly I need it, because if I know the store round the corner or the store half an hour away has it and I need it as a present tomorrow, then I will go and buy it from there. But if I can wait two three days then I will buy it online.

A: So it might depend on the circumstances.

M: And then there are incentives like the cash back things so if you buy ~...then you get points for buying that or ~...

A: OK great. The next stage is purchase but we have already discussed that so lets go to the last one, after sales service. So continuing with the example, you have a computer and there is a problem with it. In which environment would you prefer to get after sales service? 3234

D: It is easier to do it face to face, because if you email someone you can wait for two three days.

D: I suppose you can ring a help line, but maybe going to see someone face to face is the quickest way to do it.

D: Unless you have a really good return policy like Amazon where ~...they provide you with a barcode to put on the side and everything. If you had something like that then it would get closer to being as good as the face to face.

A: Oh OK.

D: The problem with Ebay especially if you buy the electronic goods is that there are no such return policies or guarantees. ~... I don't trust Ebay.

A: OK, apart from what we could call functionalities, if we assume these functionalities are the same across the channels, which would you prefer as an experience?

M: I prefer just sending stuff away because you can just print out the postage and bag it and just put it in the post box. Whereas if you go in store then you may have to wait in line to see someone, then ok if it is in the thirty days warranty that you have they just replace it which is good, but then you could have just sent it away. It depends how far away it is too, if it costs three pounds to post it and five pounds petrol to get into town then you might as well post it. And also if it is for an item to be repaired then it does not make much difference if you give it to a store or you send it because the store doesn't really repair them themselves they just get it and send it to the manufacturer so that is an added delay you do not really need.

Fr: It also depends on the damage, if I feel that this can be easily fixed but it is just a case of me not being expert enough then I would go to the store, like for example my mother she is not an expert on computers, the CD ROM was stuck in it she called customer service of Toshiba I guess and then I explained to her that there is this little hole and if you press it the CD comes out. So of course she regretted not going to the store because if she had known she would have gone and they would have done it.3600a

M: That is probably the fault of the people on the phone, for not having told her.

Fr: Yes but I mean if I have the impression that something can be fixed and it is just me not being extremely confident or expert enough, I would try at least before I opt for the option of sending it back. I would say OK, lets try and then I will always have the option to send it.

A: So you would like advice in that situation first and then if it is serious then send it.

Fr: Yes.

Q.10 For a complex product would you prefer the 2D or the 3D environment?

D: I think for a complex product like house insurance obviously the advantage would be with the traditional face to face, although Second Life may have an advantage over the 2D internet if you actually had staff there to talk to. Most times there is nobody there to approach if you need assistance. In order for these virtual worlds to work they need to simulate the real world in the sense that there have to be real people there on hand to assist you. If you are looking to buy something which needs a negotiation then this sort of worlds may have an advantage if you have, for example insurance experts on hand that you can speak to.3806

Q.11 What would you buy in VW?

Fr: Exactly what I buy on the 2D internet, so electronics, I would never buy clothes or food or, I don't know, again I would buy electronics, DVDs, books, again no problem with the 3D setup as long as it is not difficult to access a particular store, it doesn't take ages or something, assuming everything is fine my computer is perfect running the 3D worlds so it is not too long a process.

M: Maybe, things that, with which I have an emotional attachment and I am really excited to buy them! Maybe it would be a better experience to buy these in a 3D environment than a 2D environment, examples would be I don't know, for example if I was a real Apple fanatic, which I am not, but if I was and I really want to buy a the new iPhone and I went to the store and it was sold out and I can't get it, and I have to get it online, I'd rather go to the 3D shop and be like 'hey I got the f**ing iPhone thing!', so it is an emotional thing which some people find valuable!3951

A: I like the way that when you thought of an emotional purchase Apple came straight to your mind!

M: First I was going to say a game console but I did not want to be a nerd!

Q.12 Which environment is the richest emotionally?

D: I think going to a shop, buying something and walking away with it is the most enjoyable, clicking on the internet buy and then it comes on its own to your door is not as good.

A: That is probably true, the real world must come first, but how about the 2D and the 3D?

D: I suppose here you could get something and put it on the counter and then take it away.

A: I have not heard about you being able to do that.

Fr: I mean if this is, if this item is extremely important to me for some reason, I mean a laptop, is not that, I mean it is, but under an emotional point of view if this is the graphic that I can achieve I would prefer 2D. A: OK.

Fr: Because maybe after I have bought it maybe I want to go back to the website, back to the pictures, staring at the items, I do not know, imagining the items on the desk, and everything, if it is something very emotional for me, now I cannot find an example. Now let's assume I am buying a dog, a real dog and I have the two options, for me it would be much better, and I cannot buy it in the real world. For me it would be much better in the online traditional channel because after that I can go online, watch the pictures and see the true object, not some fake representation.4224 A: OK.

Fr: But after that if it is not that stimulating I do not see a difference.

A: Walking about, you don't find that particularly useful? Fr: No.

M: One last thing, I find, I just realised that buying online, depending on what you buy, if you are buying digital media for example, DVDs, movies, music, or now ebooks if you have the ebook reader Kindle there is the immediate advantage that you can download it and use it at home, I mean people prefer to have a physical DVD like that but we are drifting towards digital storage where we have, for

example the Xbox and Playstation 3 you can download movies and store them and watch them directly, that is an advantage as well.

A: Yes, OK great. Anything else?

Fr: For me, when you were talking about insurance and stuff, maybe because you I am Italian and people that sell you insurance want to take you for a ride and that is it!

M: Really?

Fr: Yes, it is kind of a tradition! Exactly as estate agents and everything, I would prefer the internet, because I would say, OK it is an objective representation of the policy and nobody is trying to force me towards some products.

A: Unless you avatar has an Italian name!

Fr: Exactly!

Fr: This is something that actually happened to me. I bought my car insurance from a physical agency and everything a million problems and everything, and what happened is I had an accident with someone from Romania and as it happened Romania was not covered and this policy, so I went to the internet, I paid less, printed the contract, read it without anyone filling me with stupid words and everything so that's it.

A: Oh. OK great, can you just sign this that you have received the payment. So is anyone interested in Second Life now?

Fr: It was interesting to try it but I don't think I will become a fanatic user.

Round 2 Focus group 3

A: OK to start can everyone just say there name and if they want what they are studying, so that everyone knows each other.

N: Hi, I am Neil and I am studying maths.

F: Hi I am Fiona and I am doing English language.

J: Hi I am Jeremy and I am a first year physicist.

S: Hi I am Selina, I just finished my second year in Management and Psychology joint honours.

A: Ok.

So: Hi I am Sophia and I just finished my second year in Spanish.

Q.1 What do you think about VW in general?

D: As in a real shop they just put the same things on a website and you buy them and they send them to you but there I do not think the picture quality is good enough to buy something because you do not really know what it looks like.

A: The quality of the image in Virtual Worlds?

D: Yes, that is the thing. A: Right.

D: And also the speed, because you can just click on a page, and literally just click and see ten pages, why should you have to go into the shop and walk round the shop, it seems a bit slow.

A: Anything else about virtual worlds in general?

D: I do not use it regularly because it is very computer geek like. I do not associate myself with it really.

M: I feel like it could really have useful applications and if the graphics were better it would be really good for shopping but generally it is a bit sad.

M2: It think it is really good for some things like meeting your mates and stuff.

Q.2 What do you think about VW for retail?308

(the sweet one) The whole point of shopping in real life is socializing and trying things on. You cannot see what you look like, you would not know how it fits, despite having a character, or whatever so.

A: If you buy a virtual product then you can try it on, if it is a real one then yes, at this point you cannot.

SO: But why would you buy Virtual products just to wear them in the game? For real money?

A: Yes, well some people, for example say, oh, I have to go to a conference in Second Life, so I will buy a suit.

SO: Really? Cool! A: Yes.

M: To be fair, it does not cost that much, and if you were going to a business meeting you would do that, but I do not think people our age would buy things on it. A: OK.

D: And like the whole reason I like online shopping is because it is not like a shop! And, because I do not like shopping, so if it is more like a shop, more like reality then that defeats the objective for me, because I like online shopping because it is faster. A: Right.

D: You don't have to get into the process of walking into the shop looking around. You know what you are looking for and you just buy it.

A: So you like it because it is the opposite alternative? D: Yes! 437

A: Right, OK great.

M2: Well I think I would say it depends what it is because a clothes shop, obviously it would not work very well, because you cannot try things on but if you take music for instance if you could look around and browse things, because that is sometimes how I look for music, I just walk around and look for stuff, it could be interesting, which is harder to do online because you would wander around a virtual music store that would be great but it depends what kind of stuff you would sell.

Q.3 Criteria of purchase? 544

D: Whether it is value for money, if you need it. A: Right.

D: What brand it is. A: Right.

SO: Especially I like to, surely you have got all these shops in Second Life how can you trust that the real shop has given them a licence, like you don't really know what you are buying.

A: Right.

SO: Maybe if I went online, to the actual Top Shop website and they had this three dimensional simulation then yes, but if it was in Second Life, I don't know how you would, I think it is a bit unsafe to give your name, I don't know how you would know if that was real.

A: Well in a funny way it is similar to the real world, so if Tesco built a big store in Second Life, and had its name on it, then you would think it would be them because who else would do that!

SO: They might do and steal your money!

A: Yes they might.

M2: But it is obviously going to be easier to fake stuff online in a website because you are not going to have to build a building and write Tesco on it, and also this is owned by someone.

Q.4 Which channel gave the greatest information efficacy?

M: Well for accuracy I would say the proper website because you get a proper photo and this is just

D: And you get a full description of the item as well. 734

A: Right, OK.

D: And a clearer picture as well.

M2: Maybe if they used a website alongside this, surely you would need both. You would need a proper photo.

D: Yes, maybe if you could walk down the isles and when you clicked on things and you clicked and it told you more about the items.

A: Yes some do have that. Sometimes when it is something complicated they have a link which takes you to their website which gives more details.

D: But not even that, not even something that complicated, just the measurements, the colours and alternative colours you could get it in.

A: So you are thinking of ways of combining the best of both worlds?

D: Yes.

SO: I still don't understand the point of sitting there browsing a shop and buying things if you are going to sit at home playing this. ~... I mean if you are playing on this you might as well go out and buy something. I would rather go out and buy something than play that and then get it sent to me, and then what am I going to do, wear it while I am playing it?

Q.5 Which channel is more convenient? 910

D: A 2D website, because you search it, you find it, you read all the information about it and you buy it. Whereas this you have to go into all these different shops and walk around. I don't like the fact that, if you were in a real shop you can see the whole shop whereas here you can only see a section and you need to move to see the other side. It would just take too long.

SO: I think if the avatar could be made to look just like you then that would be very good. Like with trying things* on, you could see how things look on, but then it would not be that accurate. Do you know what I mean?

A: Eventually, things like that will be perfect, that is not the case now but it is improving.

SO: That would make it better than just a 2D website where you just look at the clothes, if you could see what they looked like on you.

A: Right, yes.

D: But if it was an expensive item, like an expensive pair of jeans then I still would not trust that image, I would want to try them on myself and know that they fit than trust that.

D: I think it needs to be more sophisticated, I mean technology wise.

M2: Yes, again it depends what you are getting because if you know exactly what you want then obviously it is easier to go on a website, search for it and buy it, but if you do not know what you want, then for some things you need to go on a shop and try them on, but for some things you could go on Second Life and browse around, because you can browse, it makes it nice.¹⁰⁴⁸

D: Yes but as much pain as shopping is it would be a lot faster than going into all these shops and looking around that way, you could just walk into a shop, browse a few rails and walk out whereas this you need to mess around trying to find all the different things then trying to find another shop. It would just take ages.

SO: ~... sometimes I think the retail service is good. If you will buy a bag, you want to go to Selfridges, talk to a sales assistant and walk out with the bag, the whole process of it, you do not want to anonymously buy a bag. I think you get more satisfaction that way especially when you buy luxury products, I can't see a six thousand pound Burberry bag being sold online. Totally, I think ~...between bricks and clicks I'd rather go half way anyway.¹¹³⁸

A: Well sometimes they have shop assistants, so they try to give part of that experience, but I can see your point.

SO: Someone employed by the shop? To be a virtual shop assistant? That is their job, to be a virtual shop assistant?

channel do you trust the most?¹²⁰¹

D: The two dimensional because it is tried and tested everyone knows it is safe, while as this is quite new, it does not have a reputation, so I would trust the more reputable one.

OK, great.

SO: Maybe in the future, when there is a chance for this to develop, and there were many sales and stuff that worked out and it had a better or more long standing reputation, if the technology had increased so it was better, and the images were better.

A: So at the moment you believe 2D but you think in the future if it overcomes its flaws it might be as good or better?

SO: Yes.

Q.7 Relative Advantage of VW?

D: It is like a middle ground, like if somebody doesn't like shopping on the high street, because maybe they find it a bit intimidating or claustrophobic when it is busy and things, but they do not like the solution of 2D websites because it is not real enough so maybe so maybe it could act like a middle ground for those people, but I do not think all people would find this very useful. So I think just this set of people so I am not sure how much money you can make off it.

D: I think there is definitely a market for it, and for virtual because my boyfriend plays on World of Warcraft and he even pays a subscription for that. So there are people that are interested in it. I think virtually it has even more potential than buying real products for real life.

A: Yes, people use it to socialize so it is similar to World of Warcraft in a way.

M2: I think one of the major advantages online and virtual worlds especially is that it is personalizable, so you could walk into a shop and you know it would only have stuff that you wanted in that shop, or something. You would know that you would not have to fuf around finding loads of things that you would definitely not need, like I do not know.

Q.8 What are the purchasing stages?¹⁴⁵⁸

SO: We sit at home and read thru all the magazines and decide what to buy, we all have the best time ~...and then we go, it is a combination of things, always trying to figure out a reason to buy things.

Not just to force them ~..., so I say oh I'll just treat myself without a reason, so if you are sitting at home and playing this then I don't know if you would say oh yes I need a new outfit I'll do this when you can go to the shops and do it. I don't think that is good for 'impulsing' because when you are sitting and buying on the computer you can just keep buying for ever and ever and ever and ever, but

if you are in a shop and you are handing over cash it is different. So I don't see how you would impulse as much. A: OK, so...

SO: I wouldn't just browse and say oh my gosh, you could sit here and buy everything in the shop and it would not really feel like it! A: So if...

SO: If you are not walking round the place.

A: So if you try to break that up into stages.

SO: So I would not go in there think, that is nice and buy it, I'd think more in a shop and I saw it physically I would be more encouraged to buy it, I would have a bit more motive but I cannot trust what I see in Second Life as much so I would not let myself impulse, I wouldn't let myself.

Q.8B Best channel for each stage?1645

SO: Yes it is there so you can just have a better perception of it while as here you do not know 100% what it is going to be like so you can't take a chance.

A: Right anyone else can think of the stages of purchasing?

M2: Well I think I normally know roughly what I am going to get so I go into town and say I am going to get so many T-shirts and a pair of jeans. Then I'll look around and see what there is and try things on, then once I've looked at a few things and I find one I like more than the rest I'll buy that.

A: OK.

M2: Music I tend to have a rough idea of what I am looking for, go in have a look at a load of things, normally music is more of an impulse thing, I haven't listened to this so much before necessarily, but I'll just find something that sounds good and buy that.

A: OK, so if we think of the things you have come up with, those are, firstly a vague idea of what you want, then you browse and if you find something you like you buy it. So for those three stages which channels would you prefer?

SO: Well the internet is great for inspiration, so you might say oh, I will browse the online shop and then go and try it on. I think that is a good idea, because you do not need to waste your time.

M: You use it to get a vague idea and then you go to the place and look around. M2: Yes. SO: Yes.

D: Some times I go to 2D websites just to see what is in the shops, to see if they have what I want and then I will just go in and buy it, because that is the easiest process, just search for the shop, search for what you want, and then go into town and just buy it. It takes like fifteen minutes because you know it is there, rather than going and just browsing shops aimlessly for what you want.

A: Right once you know what you want the next stage is browsing, which would you prefer for browsing?1858

M: The ~... old one.

M2: I think again, when you are shopping in real life only you yourself can change things, the shop is there whether or not you are and you have to go and look for things, while as online if the technology improved a shop could change only because you were in it to only have the things you wanted.

Obviously not yet, but...

A: So you consider the real world better for browsing, between 2D and 3D?

D: You get more of a sense of browsing in Second Life, instead of just clicking on a link, or on different links, while as this is more like checking out different items, but it is just too time consuming, the way it is, the way it is laid out, the way you have to walk around. You cannot walk around, in a virtual shop as fast as you could walk around in real life.

A: Right, OK.

SO: Unlike three dimensional sites, at say Top Shop you can search for items, say dresses, or a certain top or a certain colour, whereas in a three dimensional shop you do not really know where everything is, and it is more difficult in that sense.

D: You can't really see what is on the rails so you would have to go up to each individual rail and it would take ages.

Q.9 Preferred channel for each stage?

D: That is a bit different because that is an expensive purchase. When it is an expensive purchase I would rather do everything in the shop, so I could speak with someone. That is also based on the fact that I do not have so much knowledge about computers so I would do everything in the shop, I would not trust online. Whereas for clothes or things like that then I would not mind having a browse thru that to make a selection, but that is because they are not very expensive items, a laptop is like £500.

A: OK.

D: It's different.

M2: I think I would do a lot of research first on the internet for something like that.D: Yes.

M2: Also I play base so if I am buying a new base I would do loads of research online, I would not actually buy it online but I would do the research, look at what bases are good for what, the price range, what other people said, I wouldn't buy one without trying it but I do all the research because it is much easier and I would find out what others think and like all the exact spec without needing to go and measure it myself.

A: Well that is what they mean by requirements determination. So do you see any difference between 2D and 3D.

SO: I think it would be useful for faster fashion because obviously it is harder to shift things over and put them in stores, for example Primark have a turnover, of say changing the store every day, you could put things in Second Life shops straight from the factories and God knows where. So it might be faster for a fashion retailer in that respect, or maybe if there were exclusives, say they were on sale only online today and they sell out in a second, like with Kate Moss or something it might be useful for that but I don't think anything can compare to going shopping and having all that, the music, we were going to go shopping afterwards and we were like yes, this is good, the last shopping in Manchester, the music and when you buy things you might get freebies or something.

A: OK.2253

M2: Also something like Second Life it is not easy to get something like reviews and other peoples views, because online you always have what other people think of this product, which obviously you can put it in, but it is not immediately obvious on Second Life what other people would have thought of this.

A: Yes, OK the next stage, vendor selection. So you have decided what you want and you need to decide which vendor to buy it from. Which channel would you prefer for this and why?

M: The 2D because it is easier rather than just going round the shops.

D: And you could have four tabs, one for each shop, just loaded.

D: Yes.

M2: Yes.2342

SO: With laptops you are less concerned with looks, you are more concerned with the figures and the facts. You don't need to go physically in the shop to look at it. You just need a list to read. You don't need images so much, just the words, so what's the use of a shop simulation then ~...like in real life.

D: I think price is also an important factor you don't know if in one shop they will sell the exact same product cheaper or they might be offering other add-ons, sort of, I think it would be harder in Second Life to compare, because like they said you can have three different tabs open in a website, but I do not think, here you would have to note it down on pen and paper, so it seems like more hassle.

D: Yes.

A: OK great. So then you have the purchase, you have decided what you want and you are going to buy it, either in a 2D website or a 3D world which would you prefer for this stage and why. So the product is the same and you are deciding which channel to buy it at.2447

D: It doesn't really make any difference to me because that is probably the shortest part of the process, you just put in you card details and stuff, but at the moment I would rather do that in a 2D website because that is what everyone knows and nobody really knows how reliable this is, but in the future, if it had a better reputation and people knew more about it I do not see why I would not use it. Like I said it is the smallest part of the purchase.

M: ~... would be good.

D: Yes, you have to think about that.

SO: In a store you have it there while as in that they have to post it to you.

A: OK great, the final one is after sales service, so if it helps you can think of the laptop again. So say you bought the laptop and you have a problem and you need after sales service, either for advice or to replace it, which channel would you prefer?

D: I would prefer real life for that, I would prefer to speak with someone.

A: OK, how about between 2D online and 3D online?

D: 2D, but still only marginally. I would not really like to do that, but it still looks a bit more reliable than this. I would not want to go to a computerized shop assistant and say my computer has a problem, can you fix it. It is not like you can take your laptop in with you and say look it is broken.

D: Yes.M: Push it thru the screen!

D: Yes, no, I would not find that very helpful at all. It would be more infuriating as well it is just fake.

Q.10 For a complex product would you prefer the 2D or the 3D environment? 2738

D: I would prefer two dimensional, for the reasons we said before, you could have a few tabs open and look at the different ones on offer whereas with this again you have to wonder round the different one and again like they said, make notes, find your way, find your way back and it would take a lot longer.2740

M2: I think I would prefer 3D, it is more like phoning someone up and saying well what is your house insurance like? Because you would not have to go through all the faf [sic] of how it, working out exactly how it works yourself you could just ask someone how does your house insurance work and you could ask a few people and it might take a while but it would be better than working out how it works yourself.

D: But wouldn't that take longer than just reading what the benefits are?

M2: It depends how intuitive it is, if it is really complicated like house insurance you might want to talk to someone, whereas...

D: But would you trust someone on the screen to actually talk to you? And...

M: If they work in the actual place then yes.

D: No, I would not trust that, for something expensive like house insurance.

M2: Well if you went on the actual companies website and it took you to a link, straight to Second Life here, and then you could talk to someone, a bit like talking on the phone, so you have someone face to face.

D: Like video conferencing?

D: It would be a bit more personable than 2D.2901

M: ~... Not if you just text thou.

Q.11 What would you buy in VW?

D: Low involvement products, things like a book, yes, I would buy things like that here because it would not make much of a difference. If it was cheaper in one shop than the other, whether it was in 3D I would buy it.

D: Yes low involvement, but I do not think I would buy any high involvement, anyway 2D or 3D.

SO: I don't think I would unless I had to because I would always choose real life over this just for the shopping experience.

Q.12 Which environment is the richest emotionally?

M: Emotionally it would have to be Virtual World but that would be only because the 2D has absolutely no emotion at all.

A: Ok, by emotion that could mean anything, from exciting, intriguing, frustrating...

D: This is more stimulating than a 2D site definitely, you have to think about it a bit more, work your way around, so it is a bit more of an experience than 2D, whether that makes it also more work, and more time consuming...

SO: You seem to have more control over 2D maybe, this is a bit more, you know you walk into a shop you don't know what it is going to look like, but the 2D shop you know what it is going to look like.

D: Standardised.

D: I think if you are shopping for an experience, I think if you are shopping online the main advantage is speed, if I was shopping for an experience then I would do it properly, I would not go online and say oh I got excited by my purchases today.

A: I suppose you are right, the real world is better, that is why I am comparing 3D to 2D in this case.

D: 3D would be better then.M2: Yes.

A: OK great, thank you very much, so if you can sign that you got paid...

Round 2 Focus group 4

Q.1 What do you think about VW in general?

D: Sorry find what appealing? Virtual Worlds?

A: Yes. Virtual Worlds like Second Life in general.

D: Oh right.

D: Last year I set up an account because me and my friends thought it was quite funny, but after a day we ~... bothered with it. But I can see why people find it appealing because, it is, I suppose a way you

could spend hours online, talking to people, socializing if you did not want to do it in the real world. But I thought it was quite funny, when we did it.

D: I agree that people, I can see that people find it appealing, that they are willing to spend that amount of time on it but that is also what I find quite scary I think! Because people are not really living in the real world anymore it is a bit weird. Like there was that fantasy game online wasn't there I cannot remember what it was called, and people...

A: World of Warcraft.

D: Yes and people were like, neglecting their kids and kids were starving to death because their parents were playing World of Warcraft all day, and were not interacting with people.

Q.2 What do you think about VW for retail?

D: Well if you were shopping in the real life version of this then you would be able to see the clothes, if it was clothes, you would be able to see them first hand, you would be able to feel the material, and then you would be able to try it on for real, on your body. I mean I know here, I know you get the chance to try it on, on your fake person but whether that will fit you in real life is debatable. And just from the picture of the clothes, I mean I know online you only get a picture as well, but I think it is harder to gauge whether it is a suitable buy and I think, whenever I have bought thru internet websites I have always gone thru companies that have normal shops as well, so I know that it is a trusted brand, and I kind of know what I am getting. If I was buying from a Second Life I would not be as confident in what I was getting.³²⁵

A: How about if it was the same, so if it was a brand in Second Life. So if you had a Top Shop or a Debenhams in Second Life.

D: If I had the time to play and go looking around then maybe it would be fun but if it takes this long to load and, then it is easier to go on to the website...

D: ~...you would get them eventually.

D: I suppose it would be quite fun in a way to do this at home, and you might be able to, I know this sounds a bit odd, but you would be able to browse around the shop, and say oh I want that tank top over there. So yes, that might be a benefit. A: Yes.

D: Yes I think if you are willing to invest that much in your character, I mean time wise then you might as well be able to shop for it. It is the same isn't it. If you are willing to live a second life inside the computer then yes, you might as well shop for it and have facilities for that, but I do not see how this applied to real life. A: Yes.

D: Are you talking about using a program like this to buy real products?

A: Yes to see if that would be a good idea for the future. D: OK.

D: It would be good to have it all in a head set. A: Oh.

D: So it felt more real, but even then, I think I would find that a bit strange.

Q.3 Criteria of purchase?

D: If you think it is a suitable product, so if it is the right size, the right serial number, the right product and also if you can rely, if you think it is a reliable company.⁵⁵¹

D: If there are reviews as well. If you have not seen the actual product, so say you are buying headphones, and you haven't seen them in the shop and you don't know the model and the serial number and you do not know what product you want specifically then you can browse the reviews and they will say oh they are really good headphones and that influences you, doesn't it.

Q.4 Which channel gave the greatest information efficacy?⁶²⁰

D: Well I suppose when you are using the 2D websites at the moment all the information comes up, so when you click on a product it comes up and says the size the material and it has all the information so if you were using this, if when you clicked on the jeans instead of just saying buy this it came up with a little information box saying: Jeans, size, make, serial number, make, product reviews... If it had all that linked in with the virtual world that there is in Second Life then that can work.

Q.5 Which channel is more convenient?

D: Just time wise, in terms of loading, if you know specifically in terms of loading I think 2D websites are better.

D: Yes, I agree.

Q.6 Which channel do you trust the most?

A: OK. So again you are buying something from the two channels, which do you trust the most? You might want to compare it with the real world too. So you are buying something, which would you trust the most in terms of your money and what you are getting.

D: Trust the most in terms of your money?

A: Trust in terms of your money and that you know what you are getting. What you thought you are getting.

D: I think the real world is the best, because it is physical, you are handing something over and you are getting something.

A: OK, between the other two?

D: I don't think there would be much difference, as he said, if they had extra information, if you were shopping for, we are talking about shopping for real products aren't we? A: Yes.

D: Well it would not make much difference, you would be able to trust them presumably. If you knew there was some kind of overlying system also it is edited, there are people in control of it so as long as there is someone you can contact if something went wrong, like in a 2D website you know you can just email them, or email their customer website or, if they have the same type of thing for this then it would be an equal choice.

in terms of online shopping compared to the real world, I think it is sometimes easier to find things cheaper online, so that is an advantage. D: Yes.

D: So that is an advantage of online which applies both to 2D, and to Second Life, and virtual worlds. Q.7 Relative Advantage of VW?

A: OK great, so again these questions overlap but they focus on different things. So what do you believe would give virtual worlds a Relative Advantage?

D: Over 2D websites, or the real world?

A: Yes 2D websites or the real world.

D: One advantage would be, say people enjoy the actual experience of shopping, it is more like the real world. So say you don't want to go out because it is raining or because it is the weekend and it will be crowded, then this would be more like that experience than 2D shopping is. A: Yes, OK.

D: I think it would be, I think if you had the time, this would be slightly more enjoyable, in kind of a funny way, rather than just clicking on websites to website. Because you would be able to go into a virtual mall and be like oh look let's go into that shop and then you would be able to just talk to random people.

D: Yes that is true, because it is interactive. But I think it might get frustrating after a while because it is time consuming, you do not just click on a link you have to move round a 3D space.

D: It is obviously some times more convenient than going shopping, if, like, you did not live near shops it would be easier to shop online, but once again it would be quicker to just do the 2D websites. So it depends on how much time you have available to shop. ~... quality of services you got. 1113

Q.8 What are the purchasing stages?

D: If you know, like, maybe if you know, or if you are doing research into products you might buy, so if you are going to buy a computer you could look for reviews and find out which computers are good and which computers are value for money. So you would want to research what the product is like, you would want to think if you can afford that and then compare those two things before actually buying it. Does that make sense?

A: Well if it makes sense to you, there is no right and wrong, it is just a matter of how you do it.

D: But if it was, if it was clothes then you cannot apply that, if you saw something you liked you would like to try it on, see if it was appropriate, and then see if you had enough money, so a couple of stages.

D: And some people would then just buy it and some people would buy it and some would say, right I will come back for that later and then they will carry on looking around until they see something better or even something similar and then they compare the two.

A: OK, so you are saying, correct me if I am wrong, you do your research first, then you find something, then you see if you can afford it and then you buy it. Something like that?

D: I have a little review before I buy it, can I actually afford it, but if I had loads of money it wouldn't matter!

Q.8B Best channel for each stage?

D: I think the two dimensional internet because there are already many established websites where

you would be able to find reviews, if it was something like a computer I am sure there is a lot of, like my dad, he is an IT teacher and he buys loads of magazines as well, like PC Pro and they have websites and thing, and they are set up and trustworthy and reliable so you can go thru, but in the real world, if you were going out shopping and you said oh, I want to buy a black T-shirt then the only research you could do would be to go from shop to shop to compare, so that would be time consuming.A: OK.

D: I think, yes, researching on the 2D internet is good because you are getting a lot of text. But when you are buying a phone, or ~... and you go to the Orange website a box pops up and you are talking to an actual advisor about your plan and stuff so I can see how that would apply to something 3D because you could speak to a real person, assuming real products are being traded.

A: Yes there are sales assistants.

D: Yes so that would be their job and then you could talk to them to buy the computer. So that could be good, getting someone, from, you know, PC World to talk to you about the product.

A: OK great. So let's say the next channel is purchasing, which channel would you prefer to do that part in? So you have decided exactly what you are buying, in which channel would you prefer to do that?1513

D: Some times for eases sake, if you are in a shop you wouldn't actually pay by cash you would just use your debit card as well, so it has become more similar to using a debit card on the internet, whereas before it would be a lot more about having cash in hand and knowing how much you physically have on you, whereas nowadays it is more about, it still kind of think, oh I'll put it on my card, it is kind of virtual money in a way, even when you are physically shopping. One thing it also relies upon is trusting the site so as Second Life is owned by a company and if it has the security set up then I think you probably would buy, I personally would feel confident if I felt the security was appropriate and it was going to look after my money.

Q.9 Preferred channel for each stage?

D: If, that's quite good, because if you want to compare price, physically you would have to walk into two three stores and see if there were special offers, physically which might take time, but I know there are 2D websites established, like Kenkoo were you can say whether you wanted a certain CD and it would come up with a list of the competitive websites, so it would say Amazon this much and then it would come up Play.com this much so you are able to easily compare prices there.

D: So presumably that could be applied to this as well.D: Yes.A: OK.

D: I don't know, if you walked into a virtual HMV thou, you might, it might be harder, if that is the way it would possibly go it might be harder to compare with other shops, so you might have to walk around the virtual mall.

D: How would you find the CD, would they still do it in just pictures, images?

A: Probably, yes.1804

D: And then, what, you click buy and pay for it in Linden dollars?A: Yes.

D: So that is a disadvantage because it is more time consuming, you don't know how much you are going to spending, you would have to sort that out as well.

A: OK, the last stage is after sales service. So let's say you bought a laptop and you need after sales service, which channel would you prefer and why?

D: This could be good because if you have the physical product at home, it is late, none of the help lines would be open for the real world shops, would they, so you could just go back to were you bought it in Second Life and ask someone, if they had people who worked there all the time.

A: So which would you prefer? You have identified some of the benefits, but which would you prefer?

D: I would like to speak to someone, so either take it back to the shop or call someone.

A: OK. So let's say you are ranking things, those two are first, which would follow?

D: If this is more immediate than the 2D, then this first.D: Yes.A: Alright.

D: And if you were able to have a virtual conversation that might be slightly, that might be a benefit, rather than emailing and waiting for them to reply, for you to email back, for them to email back. So if you were able to have a virtual conversation there and then, then that would, that could be a benefit.2008

Q.10 For a complex product would you prefer the 2D or the 3D environment?

D: I think that with something more important it might be more beneficial to do it in person. I know

there are some websites like Confused.com which can find competitive quotes for online, so if money is an issue, but between the virtual world and the real world for something like this it would be better to talk to someone face to face.D: Yes.

D: I think there is probably, ~... in the website, the trust came into it as well. If it is something very important then the personal aspect is also very important.

D: Yes if you are seeing a doctor.D: Yes.

D: You wouldn't want to do that online.

A: OK so we agree that the offline is better, so can you compare the two dimensional to the three dimensional, again if we take house insurance or car insurance?2227

D: I think it is the same as the previous question, if this is more immediate, if you can get a conversation going with someone who knows what they are on about then this is better. Because you do not have to email back and forth.

D: One benefit thou which might lie with 2D if there is a lot of criteria and information, on a 2D website that would be quite easy to read, whereas with this, I do not know if you can walk into a factory shop and then click on the house insurance box, I don't know whether it would have the same level of information that you would want to have as a consumer.A: So...

D: You can have a little virtual list.D: Yes.

D: Like Tomb Rader. I used to pick stuff up and it would tell you what it said! You know.

A: OK, I'll try and summarize, so if there is a real person there and they are knowledgeable, then you think the Virtual World has an advantage but otherwise the two dimensional is better.

D: Yes because you can read, would you be able to save text on this? Like would you be able to prove that you spoke to someone and this is what they advised you to do?

A: Well they could send you an email at the end of the day.

D: But no one would be recording the conversation with them?

A: You could, but it would not be a legal document.

D: Yes so if you wanted, if you wanted to take them to court there would be no proof, whereas if you have the email, you have the email, you know, your email provider could verify that that has happened.

Q.11 What would you buy in VW?

D: If I was to use Second Life I might buy the same type of products I buy now online, so CDs, DVDs, presents, ~... more rarely clothes, but I do not know if I do it now. At the moment I trust the companies that I use online so, because I know this has not become established yet. If in the future this became an established process and it was known to be a good service, a secure service, then I might turn to this, but it would be those sort of products I bought before.D: Yes.

Q.12 Which environment is the richest emotionally?

D: This would be more rewarding if you were going to invest your time in it. As I said before it is more like the shopping experience, if you are spending time doing it you aim to speak to people about it, so this would be more rewarding I guess.

D: I think it might also be, if you have the time to spend on it, like it might be a lot more enjoyable, just to wonder around, fly around, buy some shoes.

D: That is if you know what you want, I do not think I would browse just anything. Like it would be more time consuming if you did not know what you wanted. Just to look around and browse shops, rather than browse in a 2D environment.

A: This question focuses more on the emotional side.

D: I don't know, it would also depend on how quickly it would load, I mean I know there is a vast amount of information in 3D Virtual Worlds that you would take a while to load up but that make you quite angry. You might just get fed up and go to the 2D which would load more quickly.

A: So it is more motional, but it might be negative emotions too.

D: I suppose it depends on your own internet server and connection and how fast you can access it.

A: Yes. OK great.

D: I think there is a definite market for it but not yet, I do not know.

A: Yes it is a new technology so it has a hard time at the beginning, when it has to sort out whatever needs sorting out. OK great, thank you for that.

Appendix E: Interview data

Interview 1

Participant: Age: 62, Gender: Male, Higher National diploma, 2/3rds of a degree and 672 days.

Participant: Yes.

Participant: That potential is enormous for personal development. But commercial concerns seem to override this. SL is not a game to my mind, but a social network and a place to learn and develop.

Participant: I can be "me" more easily in SL. There is a barrier which strangely opens people up and they are more themselves in SL.

Participant: Yes. People can always be Basic Accounts, of course. That is free. But they often find that they want more from SL than that. That means they have to pay. To pay they could dig into their RL pockets, and that's fine. But others are attracted to the opportunities to create and thus make money. But then it goes to a greater level where the money is more important than the creation.

Participant: Yes. The SL economy is very limited at 250 L\$ to the USD. So I have just been paid L\$300 for 2 hours work as a journalist. That's 57 cents an hour

Participant: Yes, absolutely.

Participant: OK.

Q2

Participant: I have found that there are so many dreadful Malls selling the same things. My personal interests were, at first, a new avatar, and clothing. I bought a lot of poorly made products, because of the price. I then learned to be more discerning. I now only shop to replace something that I deem to be of a poor standard, clothes etc., Or... If I have a project in mind. Like my new office that I rent. I buy furniture and accessories and business items, like laptops that work in SL. However, I love in world art. I buy a lot of original SL art.

Participant: Most accurate would be offline. You can see and touch the product. Next would be internet where you can only see the product. SL, however, is strange as it is a mixture of both. You can see RL photographs of a products and you can see SL 3D replicas, sometimes. There is a company called IWooot which sells RL products through SL.

Participant: I think it would be more useful. SL can offer one on one contact with the seller where you would have to telephone someone in RL when shopping online, if you needed further information, one on one.

Participant: At the present time, 2D is more convenient because it is very much part of RL, but can offer global purchasing power. But SL will catch up when the business people learn of its capabilities.

Participant: SL adds visual authenticity to the chat room. The chat room is as quick as a phone call but cheaper, Business people can show their wares in SL, they can discuss their wares in SL they can even store their wares in SL, as though it were a website. But they haven't learned about the potential of SL. There are some here. But they don't understand it.

Q Trust

Participant: Wow! Trust. I suppose 1) Offline, 2) 2D, 3) SL.

Participant: 2D more because everyone's identities are RL identities.

Q RA in retail

Participant: I need a quick think, sorry!

Participant: SL can bring intimacy to business relationships between companies and individuals who are physically maybe thousands of miles apart. by intimacy, I don't mean anything rude! Just as we are in the same "room", now.

Participant: Ok. Hit me.

Q Purchasing stages

Participant: Requirements... offline unless of course I am "living" in SL. That would limit my requirements to SL requirements, I think. Therefore I would determine my actions according to my requirements. RL needs , RL actions. etc. Vendor selection has an SL bias to the terminology. Do you mean shop of store in RL? Or ...?

Participant: With Laptop as an example it would be offline, all the way, however, I buy my books and other small items through Amazon.

Participant: Offline gives the promise of better after sales service.

Q Simple and complex products

Participant: Both, I use the internet.

Participant: Because of the American bias in the population of SL, I would choose 2D. But... If I could find a British supplier on SL, I would go to SL because I like the SL experience.

Participant: Wow!

Participant: SL wins hands down.

Participant: In SL I have bought beautiful art, a motorbike which I can ride on virtual roads. I have bought a helicopter and fly as far as I can and get a really joyful experience from it. Also I can sit in my little office and try things in SL, I meet so many people in the process. If I want to buy a shirt for my AV, I could be standing next to a lady from Ohio buying shoes, a shirt.

End of interview

Interview 2

Q1

Participant: Hmmmm, for me, second life has many facets, the most part, it is a place to meet new friends. If it wasn't for the friendships I have found in second life, I doubt it would keep drawing me in. But also, there are other aspects, for example fashion within second life, and architecture, I adore seeing the replica cities that have been set up. Such as London, Paris, and a couple of the Venice sims.

Participant: is that enough detail? I was unsure if you wanted a sentence or an essay, so went for in between.

Q2

Participant: Shopping in SL is very varied, a huge diversity of quality and price. The customer service seen is also rarely that of rl, as there is little accountability on the part of the seller for their products. Only through a very lengthy process complaining to Linden Labs will you get anywhere if you need to make a complaint. The search system is also terrible, relying on traffic, rather than relevance, hence you have shops that just hire 'afk' models, campers and bots, which ruins part of the experience.

Xstreet however is a very pure tool, allowing you to see items ranked according to popularity, and it is often the bargains that gain this popularity, up and coming designers who are not overcharging, but are still very talented.

Participant: I can go on, but I doubt you wish to hear about all the best shoe shops in SL.

Participant: SL is improving, but only due to the people within it, if you do a survey about whether or not LL is improving SL, then the answer would be a decided 'no'. The latest clients are terrible, forcing people to use alternative viewers to the official ones. Thus, it is the people, their ingenuity and will to make SL a better place for everyone that is improving it, not the officials at Linden Labs.

Q3 Accuracy of information

Participant: Do you mean for example off amazon.co.uk and sites like that?

Participant: From my experience, the most accurate and useful information usually comes from the consumers. Posting reviews, in this way, both Xstreet and Amazon are very similar. Of course purchasing within SL is very much like in rl, you only have the display made by the seller, and perhaps some of their employees to help you. In this way, the best places to shop would have to be utilising a website such as Amazon or Xstreet, as you are able to garner unbiased opinions before making the purchase. Forums, I have found are also extremely helpful, as everyone always seems willing to help out.

Q4 Convenience

Participant: I would have to say 2d is the most convenient, as utilising search engines, you are always able, in the main, to find a review, and or technical advice on the product you are looking at. On the other hand, I will usually go and view the product, either offline or in SL in order to see what it looks like 'in the flesh' as it were, without the enhancements made during the photographing of it.

Participant: I'm sorry, would it be possible to pause for literally 5 minutes? My puppy has just knocked over his water bowl.

Participant: I will be right back.

Q5 Trust

Participant: Back, sorry about that.

Participant: Hmmmm, the one I would trust the most is offline, as you can physically hold the product, and obtain a physical receipt for your purchase. With SL, and with Xstreet, there may be delivery difficulties, and you could be waiting days before you're able to contact the seller.

Participant: Hmmmm, I would say for me it is equal, as they both have the same difficulties associated

with them, in that you are not able to physically hold the product. They also share the same difficulty of delivery, where you are detached from the process of actually receiving the product, and have to rely on the sellers to keep you informed.

Participant: Hmm, I would say that they are many and varied, however, the main ones: first is that of anonymity, if you do not wish to share details of your rl, then no one will force you. It's a fresh start as it were. Second is the ability to only associate with those you wish to, it being devoid of social pressures, thus very strong friendships can be generated. Thirdly its the ability to be something you are not in rl, for example in sl, I have a tail, not because I want one in rl, but because of the sheer fact that I can, and think it looks interesting and is fun.

Participant: in a retail sense, these come into account, with people choosing wildly different products to what they would choose in rl, due to the reasons above. Furthermore, in retail, there is the concept of cost, with items in sl rarely costing more than a few pounds at the most. This is due to the lack of manufacturing costs etc, the ability to, once you have built something, continue selling it from that one copy forever.

Q6 Purchasing stages

Participant: Well, the requirements determination is pretty universal I would say, with each of them providing advantages in deciding what the next item is that you need. For vendor selection, I would have to say 2D, as you can browse many different sellers in a small amount of time. For purchase, I think offline, as you have the satisfaction of having the purchase physically in your hands. And for after sales service, it is offline, due to the ability to talk to people face to face, but also the accountability and laws which constrain the sellers, forcing them to deal with you if their product is faulty.

Participant: Hmm, personally, I would combine the 2d and offline channels, using the 2d channel to garner advice and information. I would then ring the seller, and ask for the exact details of what I am purchasing. From there, I would maybe seek the advice of a friend who is more knowledgeable than me, and then finally make my choice on purchasing channel based upon both prices and convenience. If those two factors are the same though, I would most likely do it over the phone, due to a reassurance at hearing and actual person is dealing with my details, rather than an automated system.

Participant: Well.....sl is just a bit too new at the moment, it is still growing and maturing, still a fledgling concept, even after the four or so years it has been running. At the moment, complex products such as house insurance may be available, however I haven't heard of them, and until I do, and it has been verified to be trustworthy by a multitude of people, I would pass it over in favour of the tried and tested methods, until such a time when it is shown to be the best method.

Participant: You're welcome.

Participant: Mostly superficial products, as you can see, appearance makes up a large amount of my purchases. Clothes, shoes, skins, hair etc. I also buy items such as weapons for role-play sims, I have a 'kybox' which functions as my home in second life. I also buy textures and 'sculpty prims' to aid me when I am building within second life. But as for what I would buy if they became available....I think things like a mobile phone bill, if '3' were in sl, I think it could be a great way of interacting with your service provider. I would also purchase things like eBooks, mp3 songs, all downloadable content, which can go straight from sl direct to your pc.

Other participant: Sorry.

Participant: Its 'okies'.

Participant: Hmm.....I would say that that question has two aspects, for me purchasing in SL is the most emotionally rewarding in the short term. This is because it is instantly delivered, and you can view, and utilise your purchase as soon as you receive it. However, a lot of items in sl are quite superficial, with your perception changing rather quickly, therefore, in the long term, the 2d environment is the more emotionally rewarding in the long term. This is partly also due to physically having the object, if it is an object, once it is delivered, and being able to keep it, even if you no longer use it.

End

Interview 3

Q1 Experiences

Participant: Very mixed. Um... I come to SL and then I go to another virtual world, when SL gets too much for me, or too lonely. I love to build here and when I have a building project I practically live

here. Other times I come to see friends, sometimes to dance, occasionally concerts.

Participant: Well the classic thing is meeting people - I like that with a caveat, meeting interesting people. There are, if you pardon my language, a lot of jerks here.

Participant: I have found a few interesting people but I would probably count them on one hand.

Having an 'av' that looks like a pretty woman seems to attract the jerks.

Q2 Reatail

Participant: 'Ooo' shopping is something I like to do. Latest shopping - I was looking for a style of gown, couldn't find exactly what I had in mind. But went to some great shops and had a lovely time, of course I bought about 5 frocks anyway. Shopping in SL is a pleasure, mostly. In RL terms it is so cheap.

Participant: What I like - I like - the acquisition of beautiful things. Stuff! I like to look at things and see how they are made too, because I like to build myself. I like pretty shops, well designed architecture, well laid out. I dislike shops that have no navigation. And that are very slow to 'rez'. So you have to stand there for ten minutes before you can see anything. I want pointers - eg a sign/teleport to ball gowns, etc.

Participant: Oh and decent advertising helps, so you know what they sell.

Participant: Clothes, clearly. Some building things - tools, 'sculptie' bases for things. Textures very occasionally.

Participant: Furniture occasionally but I usually make that. For building again.

Q3 Information

Participant: Most accurate and useful, that's difficult. In some ways I want to say the real world - as in walk into a shop, because then I can see and touch the item. But if it is a book, say, I would most likely prefer to buy it online. And get a description.

Participant: I buy things for SL in the marketplace, SLExchange, so I suppose you could call that 2D internet. And in that case if I am buying for SL I often buy through exchange, very often in fact, anything but clothes.

Participant: Yeah

Participant: I haven't bought any "Real life" products through SL. And I don't think I would.

Participant: For a lot of things the "real world" option is most convenient, because I know which shops to go to.

Participant: Well define a 2D object...

Participant: Mm still depends very much on what the item is. If I was looking for a texture, for instance, a picture, I would go to the Net. But that's because of the difference in quality... most places in SL only sell very small textures. If I can go to the artist's gallery here in SL and order a painting, that I can see in his SL shop here, I might well buy it through SL.

Participant: If there were shops here that sold RL books I might buy from them, but I haven't found any.

Q4 Trust

Participant: right. If I imagine I am buying a laptop or real clothes, I would buy most likely in RL, or possibly on the Internet. I would be very unlikely to buy them in SL. Yes trust is an issue. Because of the anonymity of SL

Participant: Yes. People can pretend here, and do. But there is less control. The Net and RL are policed.

Q5 RA

Participant: I actually don't think it has an advantage for shopping apart from in world items.

Participant: It might be better than the Internet for one or two things, if you include being able to talk to a sales person about the item. Say for a laptop. But for me at least the trust thing outweighs.

Participant: Disadvantages of shopping here?

Participant: Well everything here is done with images, pictures of the thing you would sell. In the real world I could go to the shop then touch the laptop, feel its weight, if it looks and feels solidly engineered for instance. Images can only show so much. The Net is the same. of course.

Participant: Ok you are making my brain work. Lol.

Q6 Purchase stages

Participant: Yes.

Participant: OK four channels? SL, Internet, real shops? What is the fourth?

Participant: Oh no I got it backwards I see. Yes. The four stages describe it pretty well I think and I used to work in sales.

Participant: For requirements determination I would most likely use the Net.

Participant: For vendor selection as well, probably - to find a good price and either a local shop or an online vendor. Purchase the same, and we do buy quite a lot of things on the Internet lately. After sales service, well that has to be real world I think, for a real world item?

Participant: Yeah. It is tricky to conceptualise.

Participant: OK.

Q7 Simple and complex products

Participant: As before, I think. Probably use the Internet to search for a good deal, then find a company and I suppose make a deal over the phone or in person. I never bought car insurance, I don't drive, so I am not sure. But that is what I would do with house insurance

Participant: No, not SL, definitely not and again trust comes into it. I am wary about giving RL information to anyone in SL. because they may not be what they seem. I am also careful on the Net.

Participant: Still not SL I think - I would certainly need very strong proof that the person/avatar I was talking to was a representative of that company. It is too easy to pretend in SL. I'm afraid that has been my experience.

I would really prefer, if possible, to buy insurance from a "real" person, who is in a 'real' company office. It feels safer to me. Insurance is all about trust, I think and the more money involved, the greater the risk as well as giving info about my home, valuables, address, etc.

Participant: But I am happy to use the net to research it.

Q8 Emotional

Participant: a rich experience? Mm.

Participant: Again it so depends on the product, definitely RL.

Participant: A laptop - well emotionally? I think it has to be the RL. for the richer experience. Even if I might get a better deal money wise in the Net.

Participant: Yes it can be emotional, I can see that. There is a buzz when you buy something special and for a geek to buy a laptop, yes that is emotional.

Participant: definitely a richer experience, all the senses come into play in RL, smell, touch as well as sight, you can't buy cheese in SL it is fake!

Participant: This is hard. Maybe. If there were a really well set up shop in SL and if they could really give a great deal of information about the product. It might be richer than the Net experience, because you could talk to a real person instead of reading a web page. But I have never seen a shop like that here yet. Or if they gave you something extra, a freebie, so if you bought a Harry Potter book in SL they gave you a Harry Potter wand or outfit, or a virtual poster.

End

Interview4

Q1

Participant: Well I have been in sl for a long time now, I don't meet many people who are older in sl than I am. I stay in SL because I enjoy the friends I have made here, I find it very relaxing in the evenings after a days work and I enjoy the live music in SL. I think SL is a great experiment in human nature and its been very interesting to see how it has developed in the time I have been in SL.

Participant: Yes its getting slicker in many ways but it is also getting hungrier for better graphics cards and more powerful computers. It is much more complex now than it was 4 years ago.

Participant: The graphics have improved a lot and the general quality of the game, not sure if it is a game, is much better

Q2 SL Retail

Dart Wolfe: I don't purchase many things now, in the early days I bought a lot of things. I have had very few problems with items that I have purchased in SL. The items that did have problems have usually been sorted out when I have contacted the vendor.

Participant: Textures, clothes, games.

Participant: Because I have what I need, enough clothes of various styles to visit any event or sim and be correctly dressed.

Participant: I also play the HUD game Tiny Empires so that takes up quite a bit of time here.

Participant: OK.

Q3 Information

Participant: Well I think that real items like the goods that Amazon sell have more information available, but then real goods are a lot more expensive than the digitised goods.

Participant: Online shopping is the best as you can really research the goods you buy and get feedback from other people. Offline goods means you are dependant on the store you visit and what goods they have in stock, also you don't always get the correct information on the items.

Q4 Convenience

Participant: SL shopping is ok but it's only for your avatar and doesn't really have a bearing on real life. Online shopping without a doubt.

Participant: I research every medium to large purchase online first even if I buy from a store offline in the end. 2D I have more faith in it.

Participant: SL is ok for small exchanges of money that you are prepared to lose. There is too much chance of things going wrong in SL. Also in RL you have credit card guarantees on large purchases.

Q5 Trust

Participant: I trust online sites that have secure systems and when I know their reputation. I am inclined to use the same online sites again and again once I know that I can trust them.

Participant: Yes I think so. There wouldn't be the lag factor that you get in SL.

Participant: Well when you enter an SL shop you need to just wait while everything 'rezzes' around you, depending on how busy that sim is controls how long it takes. At least in a proper online shop it is just your connection and computer that control the time, which is always much faster.

Participant: You're welcome.

Q6 RA

Participant: That's a tough question and to be totally frank I can only see myself using SL to shop for my avatar in game. I would not buy goods in SL to use in RL.

Participant: None that I can see.

Participant: That's ok.

Q7 Purchasing stages

Participant: OK.

Participant: Online out of SL.

Participant: Yes maybe with the exception of after sales service. I would find the phone number online but then call them directly rather than email them. If I still didn't get satisfaction I would write them a letter and post it.

Participant: If you write a letter they have something physical from you that is very hard to ignore. It also means that they have to respond in the same manner. So if it gets complicated you have a paper trail that you can use in court.

Participant: In that case I would probably use SL, at least I could talk to the person concerned.

Participant: Well unless the 2D website had a chat link that you could use then yes I would be happier with SL. I like to get results.

Participant: That's ok I'm not in a rush. I am trying to give you honest answers.

Q8 Simple and complex products

Participant: OK.

Participant: Online 2D and maybe the telephone if I was unsure about anything. Would not buy insurance offline as you are tied to the person or company you are dealing with. And I don't think that SL is fast enough to do that.

Participant: The lag factor again. It drives me crazy.

Participant: Yes.

Participant: I would find the best deal online and then phone.

Q9 Emotive

Participant: Well it's nice offline because you can touch and feel the texture of the goods. But online is so much faster as you don't need to travel anywhere first. As long as you know exactly what you want to purchase.

Participant: 2D - service in SL has a long way to go in my experience - occasionally you find someone in an SL shop interested in helping you but you don't get their full attention. They usually have IMs going on, maybe music streaming etc.

Participant: Yes.

Participant: No not when I am their customer.

Participant: But I don't expect too much from them as pay in sl is terrible. Its a hobby that's all.

Participant: No.

Participant: the only thing I don't buy online for rl use is clothing.

Participant: No I think we have covered it pretty well. Because I like to try things on first to make sure they fit, and match etc.

Participant: Tiny Empires is a multiplayer HUD game with a few thousand people playing it. Its the most social thing i have come across in sl. Let me give you a link to it.

Participant: www.tinyempires.com/

end

Interview 5

Participant: Hi, noon if a remember right.

Participant: Yes easy, with it.

Participant: Can do.

Participant: Age 38, male, a level, and spend about 15 to 20 hours a week. Umist?

Q1

Participant: well been a male and female slave, as been a neko, a pole dancer. So would say tried most things on sl.

Participant: Well depends on how the sim works, some times there too much lag so kills the moment.

Participant: Hallo.

Participant: Oh yes, too many cheap items out there.

Participant: found a few friends on here, they all other the world so when we all on it gets interesting.

Flirt Walpole: Sometime, but many we role play and push the limits of the mind.

Participant: Well yes, you would not see me wearing a dress in real life.

Q2 Retail

Participant: Shopping is ok on the grid, but it hard to keep to some items as sl kind of lose prims in your inventory.

Participant: Lost a few prim items, told LL about it.

Participant: Prim is scripted item, could be hair, dress.

Participant: Hair, few shapes, skins, latex outfits, shoes, eyes, few shirts.

Participant: Kind of try to keep shopping to sl items, as a draw a line between sl and rl.

Participant: Know a few people who as gone down the line of making the avatar look like them in rl, it soon takes over and you spend your time shopping, and your friends slowly drift away.

Participant: OK.

Q4 Info

Participant: Amazon is great, eBay slow not tried sl shop yet, as most of the my friends use Amazon.

Participant: Oh, sorry, normally in Marine's, well its in the centre of a few shops.

Participant: Yes, if the information on the product card in is little to none then don't buy it, safes trouble later on.

Participant: Well depends on what I looking for but sl shopping is like surfing the net.

Participant: Like sl for that, as the designs have more fun with there work.

Q5 Trust

Participant: Trust them all the same, if I have trouble with them will stop trusting and using them.

Participant: Yes.

Q6 RA

Participant: It easier to move items around in your sl house and can load a few items with scripts.

Participant: Well it mainly a look as you cant touch or feel.

Q7 Purchasing stages

Participant: Like sl for requirements determination, as the shops don't just stock the basic stuff.

Vendor selection, as many companies in rl have a sl sim. Purchase and after sales service. Most vendors on sl don't have after sale thing as it is normal sl related flirts.

Participant: OK.

Q8 Simple and complex products

Participant: Be sl, see what I can do with it, and what it can do.

Participant: Yes as there more other items in sl that can fly float.

Q9 Emotive

Participant: That would be Amazon, as your allowed to read a review of the product and able to leave a review.

Participant: The fact your sat at home and able to check out other places of interest with out dragging family from shop to the next, so peaceful.

End

Interview 6

Q1

Participant: Good lord! Many and varied. My overall impression is that it's an endlessly fascinating place, where people who aren't generally thought of as creative can create the most wondrous things albeit hampered by dodgy technology.

Participant: I like seeing the actual builds, and seeing how people are making little businesses run. I was at a place called Whimsy the other day and was very impressed by the structure, terra forming, textures, as much as I was impressed by what was on sale in the buildings themselves. I also like seeing reconstructions of actual objects. The titanic was fascinating, as were the twin towers its sort of like virtual tourism I suppose.

Participant: Yeah, I've visited places I've actually been to see how they stand up. The Krakow sim is particularly good. I spend about 70% of my time here wandering about the place yes, the rest is socialising over a game of some sort, or shopping and building, which is about 20%.

Participant: No problem. I tend to travel directly, rather than using teleporters where possible, as you see a lot more that way. I've got a neat pair of wings that let you glide at a civil pace through whichever sim you're in. I would build more, but I find it a little frustrating, and don't really have the patience for it unfortunately.

Capability Frog: No, I often just wander over to wherever some friends are and see what they're up to. I tend to avoid dancing, as it just seems a little odd. Don't know why. But if there's a band playing I'll wander over, or if there's a good dj set I'll socialise in one of a few clubs I like. There aren't a lot of places playing my sort of stuff, or if there are, I haven't found them. But most socialising is done as part of, or over a game. In particular En Garde, and, on the odd occasions I'm free on Saturdays, the snail races at Montmartre.

Participant: Yeah, I find its more interesting that way.

Q2 Retail

Participant: Mixed. I don't shop often, I decided on day one here that I'd never spend real money on it, as there were so many things I wanted, it would rapidly get expensive. So every penny this avie has is earned by his activities on the grid. This means I don't shop often and when I do I tend to spend time choosing stuff with care

the technology behind shopping has always been fine for me. on the odd occasions an item doesn't appear I just speak to the shopkeeper and they always have been fine about it. However the quality of some of the items I've bought has been a problem. Its often hard to tell from an image how well made a piece is. I tend to be a repeat shopper, if I see one shop that does nice Victorian outfits, I'll tend to patronise that one, rather than spending hours looking for stuff in other shops.

Participant: As a pauper I don't own land, so it's all avie based stuff, whole avatars, clothes, doohickeys, vehicles.

Participant: Its mostly avatar customisation stuff, I'm terribly vain. Doohickey means anything other than the above. I've got the odd weapon or 2, some bits n pieces for fishing games. Odds, n sods.

Participant: I would never buy real clothes here, unless there were some way of getting a very good approximation of my body shape onto an avatar. If a device existed that would do that, then yes, I think I definitely would use it to do 90% of my clothes shopping. In RL I have a very short attention span for clothes shopping, SL would be a boon in that regard. I would definitely consider using it to meet an accountant. But the key word there is consider. There would have to be a valid reason to choose it above, say a Skype call.

Participant: Essentially its because, due to my odd financial methods, when I first came here I looked like a bag of spanners. I tend to refuse freebies, so I wandered the grid looking nooblike for quite a while. Once I had some spacebux I found the aspect of changing your look, gender, species etc to be great fun. So when I do have spacebux now, it tends to go on that. If I had land, or rented property I'd imagine most of my spending would go on bits of architecture and that sort of thing rather than

clothes. Also, if the technology underlying SL worked better I'd probably spend a lot more on vehicles. As it is, what with banlines and sim border crashes, vehicles don't really 'work'.

Participant: Yes. I'd say that's about right. As a vain so and so, and as someone who finds the general 'look' of avatars to be a bit uninspired, I do enjoy looking for unusual clothes, 'avies' etc, when I have money, but the pursuit of the money isn't the main reason I'm here.

Participant: At some point I'll have my 'avies' looking just the way I want them, I expect my shopping will cease then.

Participant: Wow, big question.

Q3 Information

Participant: It depends on the product really. For a techie product, the web is the way to go, for clothes, RL. SL is quite poor at giving me the most accurate info about avie customising. What I need to see is a sample of the shirt, avatar, haircut I'm buying. SL is getting better in that regard, but if I'm buying a shirt I could do with seeing it being worn on a bot for example. if it's a technical product in sl, like an airship for example, there's usually enough info for me to make an informed choice.

Participant: I tend not to use RL to buy techie stuff at all. Takes too long to wander around the shops and I can get spec info online. SL fails for the same reasons.

Participant: If say I wanted to buy a functional product from a big name, if Sony began making AO's for example, I'd be more likely to buy it on XLStreet than in world. Clothes... let me think.

Participant: For clothes I'll only buy in RL apart from in certain very specific instances. There's a firm called 'Last exit to nowhere' that make great Tee's. I'll buy them online, and indeed, if they had a shop on the grid where I could buy, I'd probably use that. There're fewer variables to consider buying a t-shirt. Sizes tend to be accurately described for one thing. So theres less worry about getting the wrong sized item, unlike say, shoes.

Q4 Convenience

Participant: Again, dependant on the product. For most mass produced objects, books, tech, etc, the net. Then RL, then SL, RL takes longer to navigate than the web, but provides me with tactile info about the product as a benefit. SL also takes longer to navigate than the web, but I don't get that tactile feedback

Q5 Trust

Participant: Probably RL, with SL and the web coming in joint second. Considering that SL is largely lawless in terms of consumer protection, most sellers are "good eggs".

Participant: No problem.

Q6 RA

Participant: You tend to be more likely to get 3d models of what you're buying on SL than you would on the web, which obviously is the nature of the medium. However, it can be argued that the virtual models may not bear much resemblance to the real object being purchased, assuming we are talking about the purchase of RL objects in SL. So the value of the 3d models is limited. All in all I'd have to say that, except for certain exceptions, there is no real benefit that SL has over the 2d web.

Participant: Thats a tricky one for me to answer. As I only buy products in SL that can only exist in sl, like my wings, airships etc. I suppose the question is do I prefer shopping in SL or real life.

Participant: I'm just ruminating, never thought about it before. I prefer SL as its technically "free" for me to buy stuff, but I prefer RL as I'll get more physical pleasure from the walk into town, the coffee for lunch, the browsing at borders etc. If I had to choose one it would be RL.

Participant: Although the thought of never being able to buy an airship again is a depressing one. I think its more of a 3D web to be honest, but one with a very poor search facility. If the search in SL was built and run by google for example, then shopping in SL would come a very close second to the web, but unfortunately the speed a web page and render, and the speed a sim will rez, are simply too far apart for it to be a really viable alternative.

Participant: ok.

Q7 Purchasing stages

Participant: No, they seem to match mine pretty well.

Participant: Requirements determination tends to be an insular activity. I realise my avatars shoes are rubbish, or I realise I need a new boiler in RL, or just decide I want a better TV. So stage 1 uses none of them. Stage 2 - vendor selection. Yup, the web I think. If its a product that requires preplanning, like a boiler or telly, then the web. If it's a product that doesn't require preplanning, like a sink plug or

a pair of jeans, I'll just wander into RL. Purchase - usually the web again, although occasionally offline for smaller items. Oddly enough I can see SL working rather well for after sales service. There's something more personable about it than you'd get with the web. If you had problems using a product for example, you could "see it demonstrated".

Q8 Simple and complex products

Participant: OK, for complex products, first the web, then SL then RL. As you can backtrack your 'route' to purchase, change variables etc, and you can do it at your own pace in the web and sl.

Participant: I do. On the web I can take ages choosing insurance for example But if I'm in an insurance shop there's the feeling of pressure from the salesman. To a lesser extent there would be this pressure in SL, but as it's, for me, primarily a typed medium, you can always say 'phone' if you want a break.

Q9 Emotive

Participant: Its SL, by a long margin. Buying online is just an exercise in box ticking. Need that product. Found that product. Bought that product. But for me, as anything I buy in SL is bought purely for pleasure, I always get a bigger kick out of it.

End

Interview7

Q1

Participant: Well, lots of fun, made lots of worldwide friends and also a little heartache.

Participant: Chatting, shopping, hosting and gigs.

Participant: Chat and dance... together.

Participant: Very positive, I really love SL, I hardly go a day without checking who's online. Even if there's no one online I know, I still come on and go dancing.

Participant: Yes, I suppose I do. I certainly don't have as many rl friends and I wouldn't be able to afford all the dresses I buy!

Participant: Yes, definitely, its easier to start chatting, hiding behind the avatar.

Participant: Well, in rl I wouldn't go up to a stranger and ask for a dance.

Q2 Retail

Participant: I love it, my experience has mainly been positive. I wish I could afford the same stuff in rl and get away with wearing it!

Participant: Well, like most women I love clothes and shoes shopping, but I enjoy looking at how well some things are made, you know, the differences in quality.

Participant: Its generally quite easy. I don't use sl mart or whatever it is. I buy directly from the shops here.

Participant: That's tricky, I'm a woman you know... on the whole, I go browsing and see if there anything that takes my fancy. Unless I'm going to a gig that has a set scheme.

Participant: Yes.

Participant: Well, mostly gigs.... haven't been invited to a wedding yet! Like last night, it was wear something tartan.

Participant: Yes.

Participant: Hmm, offline shops?

Q3 Information

Participant: First, what do you mean by offline shops please?

Participant: OK got you.

Participant: Well, the trouble with offline shops is that there is always someone staring at you, making you feel obliged to buy something. you feel you can't take as long as you like browsing. Amazon, ebay etc are ok, but don't always have what you want.

Participant: Well, probably SL... if you search long enough and go to the best shops and its cheaper!

Participant: Yes, but only because on the whole if you're prepared to spend the time here there is always the very thing that you want. Or it can be adjusted by the creator.

Participant: Yes.

Participant: Definitely.

Participant: there was a sofa I wanted, for my skybox. The style was exactly what i wanted, but not the colour or texture. I contacted the creator, who worked with me to find the right colour and texture, it was perfect.

Participant: OK.

Q4 Convenience

Participant: Well, sl, because I can see how much I have readily available to spend... no searching for bank cards or PIN numbers etc.

Q5 Trust

Participant: Hmm, I was very unsure when I first started purchasing on SL, now unless there is a problem that has been highlighted with the grid, I generally don't have a problem with sl, however...Online purchases do rely on you trusting the other party. On ebay, you can see by looking at feed back, so this gives you a good idea what they are like to buy from, and in rl, you trust the better quality shops.

Participant: You know, when you get a message saying there is a problem, don't rez or make any important purchases... I did make that mistake once, and lost my money.

Participant: Linden labs... it comes up in a blue box in the corner of your screen.

Q6 RA

Participant: Oh, that's a tricky question, let me think.

Participant: OK, sl is instant...I make a purchase and I can wear it or use it straight away, other web shopping, I make a purchase, then have to wait... and who knows how long the wait will be.

Participant: Well, I could read the profile of the vendor... you can't do that in rl!

Participant: OK.

Q7 Purchasing stages

Participant: OK.

Participant: Well, in sl, I think I want something... I do a search, I find it, I buy it... if there is a problem, I contact the creator... sorted... it fits into that category perfect, however. Offline, when I think there is something I want, often I have to wait before I can buy it, either because of cash flow, or the ability to get to buy it... this holds up the process. and similarly in web.. its finding it, waiting to receive it, then if its not right, sending it back... often I don't, I keep it and its a waste of money!

Participant: SL I guess.

Participant: Its quicker and more easily accessible.

Q8 Simple and complex products

Participant: I think 2d web.

Participant: Purely because of the way the choice can be made and changes made before purchase.

Participant: Yes.

Participant: But this time prior to the purchase.

Participant: Car insurance.

Participant: Well, I've just bought car insurance in rl. on 2d web. Am I not understanding the question?

Participant: Oh ok.

Q9 Emotion

Participant: Oh, sl, its so much fun, if I buy something for the house, I enjoy bring friends to see it or if its clothing I wear it immediately to 'show off' in!

End

Interview 8

Q1

Participant: That's quite a few, well I have had an sl partner before, I have been out to clubs, pubs etc, and also have been in business too.

Participant: Well, I do enjoy going to places and playing quite a lot of zyngo, I think the possibility of winning money and the fun of the game is good... some of the time I go to my card shop business and check to see what I can make better and improve, and then some of the time I will hang out with friends and have a good time.

Participant: Its a kind of bingo, but you can play it on your own, its pretty much the same as bingo in most ways.

Participant: In some ways its getting better, but in others its getting worse I think...they are making things better by improving the sl interface that we use, and also trying to stop the use of bots for bad purposes.... some ways I think its worse, is that they are not listening to the residents enough, and are doing whatever they like.

Q2

Participant: Mostly good! there are so many shops to choose from in sl, and it is very likely that if you can't find it in one shop what your looking for, then it will more than likely be somewhere else.anything I have bought while in sl has been good, and if I had a problem with the item at all, it has been sorted very quickly and nicely.

Participant: All depending on the shop really, most of them are set out nicely so you can see the sections nicely, men and women etc, and prices, special offers all on posters, and generally nice and easy to buy with clicking on the items to buy them.

Participant: Posters are easy to read, but 3d simulations look better.

Q3 Information

Participant: I would say 2d web shops.

Participant: This is because on 2d sites you get more information than you would do by looking at an item in a shop, say if its in a box you cant look at it, where as if they have pictures to look at online and videos, you can see more info about the item that you are buying.

Q4 Convenience

Participant: most convenient was definitely 2d web like Amazon.

Participant: I think sl is actually better than the real world, as its so much quicker and easier.

Participant: In sl, you could buy an item in a few seconds, where as in the real world you would have to put in card details etc, and wait for it to process your order and stuff.

Q5 Trust

Participant: I would trust the town shops the most and sl the least.

Participant: The main reason for this would be because sometimes if a place is laggy or sl is having problems, transactions sometimes dont get processed or you have to wait a while or try again.

Participant: I have seen it happen a few times recently, but in general it might only happen once a week sometimes.

Q6 RA

Participant: Not having to find somewhere to store your items! Not having to wait in a queue to buy the items, and also they never run out of stock like real shops and web shops.

Q7 Purchasing stages

Participant: OK, for determination I would choose 2d web shops, for vendor selection I would choose sl, for purchase I would choose sl also, and for after sales service I would choose real life shops.

Participant: I think sl has a much greater amount of items that I could ever look though in real shops etc in a day, just type in what im looking for and I would be next to a vendor very quickly looking through the items.

Q8 Simple and complex products

Participant: Oh, for car insurance the 2d web.

Participant: On 2d web you can get a whole lot of say car insurance suppliers in one list, and then choose which one you want and then customise it to what you need, where as in sl it might be a bit slower to do that.

Participant: My opinion changes quite frequently, but at the moment it is the real world.

Participant: Just generally easier to have the information infront of you in your hands. Although there can also be a sales assistant in sl. Having someone to talk to in sl is a plus, they could explain things if I had a problem. So it could be as good but it would take some getting used to.

Participant: That would be face to face first, then sl because you talk to a real person and you do not just fill in a form. It feels more intimate and 2d last. But for comparing different deals still 2d.

Participant: If I knew what I wanted, so lets say the new Dan Brown book and I just had to buy it then the 2d internet. It is the most practical. Since the product would be the same then I would use the easiest way to get it. I would not go into the trouble to log in to sl, teleport to the store just to buy a book. If it was something more important like a business meeting, or buying broadband, or changing electricity provider then it would be worth the effort.

Q9 Emotion

Participant: After the highstreet shops I would say it has to be 2d websites, they give me all the things I need to see and give me the urge to buy things. SL last at the moment becuase it is slow sometimes.

Participant: Mainly because I cant touch or feel the item that i am buying or looking for.

end

Interview 9

Q1

Participant: In general, great. That's why I've lasted so long, I think! I joined in 2006.

Participant: In SL, it depends really. I do a lot of building, for my shop and for my own enjoyment. I also shop, I hang out with friends, sometimes just explore.

Participant: Just hang out and chat. Sometimes face to face but sometimes in instant messaging.

Participant: I build furniture which I sell, but also for myself.

Participant: How do you mean? I have bought full perm sculpt kits. So I now use those to make furniture and some buildings.

Participant: No, I wish I was that successful! Furniture and buildings don't sell so well in SL for me at least.

Participant: I think there are so many people making and selling in SL. Which is of course one of its attractions. But unless you pay a lot of money for a shop in a high traffic area you don't make much I guess. Also people need clothes, but a bed? Not everyone wants a bed.

Participant: But for me it's as much of a creative thing as a money making thing.

Participant: I don't think there is not enough buying.

Participant: The SL economy is pretty healthy although it has been affected by the recession. But furniture is not high on people's priority list. Plus there are some damn good furniture builders out there. So yes, I guess it's like a hobby. Virtual Lego!

Participant: I think it helps. I wouldn't know what SL shopping habits are in SL. But I think there are some places where people shop as they would in RL. They wander and browse and hopefully buy.

Participant: Sure. I have 2 stores. One is in a shopping district. I have all my stock there as it has a high prim allowance and the rent is good. My other is a stall in a high traffic area. Quite a trendy place, owned by someone who is a well known SL blogger. If I make a sale it's more likely to be there.

Participant: More SL famous brands are at this second sim so more people visit. The high traffic one is Juicy. Not a mall, I don't think they do well in SL despite what people say. SL shopping mirrors RL shopping. Streets, shops, pavement, pathways.

Participant: I think they have a bad reputation. I don't think I've ever seen one that looks good. Or is easy to navigate. It's an interesting point though, why don't I like malls?

Participant: I think perhaps my experience of them has been bad have never found anything great there. Maybe because all the better stuff, the stuff you pay a lot for is in the places where you pay more to rent. I suppose in SL it is all about appearance and those sims which are given over to 'famous' stores have a lot of time and RL money put into them.

Participant: Malls tend to be cheaper and have lower prim allowances. So you might pay a couple hundred Lindens for 10 prims. But the foot traffic won't be as high and the 'land' owner is just trying to get as much money off his or her land.

Participant: They will have the more well known stores, they might be owned by well known Second Lifers. They will be well publicised on the blogs.

Participant: I'm not sure about functionality, it's kind of a strange concept in SL anyway when you consider that you can teleport anywhere.

Participant: On a functional level no.

Participant: I just had a thought.

Participant: Maybe because SL is so huge that these high traffic places are successful because people want all the good stuff in one area. It's easier, all the shops with the fashionable stuff are in one place. You get seen there, I guess that matters to some people.

Participant: I don't think so, no.

Participant: Sure.

Q2 Retail

Participant: On the whole my experiences have been good. If I've had a problem the seller has put it right.

Participant: Not too much. Sometimes a bit missing, or the wrong thing in the box, but I've never had a situation where the seller has refused to put it right.

Participant: OK.

Q3 Information

Participant: Wow, OK. That's a tough one because shopping in SL is just buying pixels, so it's disposable, if I don't like it, I delete it! The things in SL aren't tangible so my attitude and I'm guessing I'm the norm here, is that in SL we can afford to be as consumerist as we like and we're the ultimate disposable society but with less plastic packaging.

Participant: I think that shopping habits in SL are very different than in RL for 4 pounds approximately you can buy 1000 linden dollars and just shop and shop and shop, the clothes will always fit, you don't have to worry about wardrobe space and if you don't like something or you don't use it, you just delete it. I'm more impulsive as a SL shopper, partly because it's 'pretend' money although I now it's not.

Participant: And with at the most 60 000 SL users online at any one time, they must be doing a fair bit of shopping to keep the SL economy going. I think there's less emotional attachment with SL shopping.

Q4 Convenience

Participant: Internet shopping, for sure. I have a full time job, and a family. I rarely go proper shopping. Weekly food shopping, clothes shopping, it all gets done online and delivered.

Participant: Well I'm not sure how to compare RL and SL shopping. It's as convenient because I can do it online and so that's more time to do other stuff.

Participant: I guess in both cases I get to see the stuff on the screen in front of me.

Q5 Trust

Participant: I just trust the people I'm buying off that it would look the same when I actually receive it. I'd say the ones I'd trust the least is SL shopping, the other two, the same. I'm relying on brands to make my judgement, for my sins, in real life shopping.

Participant: OK.

Q6 RA

Participant: The fact that you can get a load of lindens for little RL money, the fact that you can just delete stuff if you don't like it, and like I said the guilt free factor, you can just go and buy a ton of stuff and it's only pixels.

Participant: Because of the amount of lindens you can buy, yes.

Participant: Like I said 4 pounds will get you approximately 2000 lindens. You can get a pack of hair same style, 3 colours for 250 L\$. So imagine if you can't shop like mad in RL. You can go mad in SL. It's cost you the price of a pint.

Q7 Purchasing stages

Participant: So you are talking about real products?

Participant: OK.

Participant: Like I said I like the convenience of buying things online. So for requirements determination I would choose the internet, the 2d internet, for vendor selection the same, and for purchasing the same. For requirements determination and vendor selection I would use sl if it was the kind of product that I could find, and if it was something I would enjoy looking for. SL takes longer than the 2d so it has to have some benefit, it has to give you some pleasure. For after sales service I would prefer to talk to someone, so I would prefer, offline, or sl or calling someone.

Participant: Well, shopping in sl can be more fun if you go to a nice place or if you go with friends, so sometimes I would prefer that to 2d shopping. It is more sociable, more of an experience, 2d is more practical and efficient.

Q8 Simple and complex products

Participant: Interesting.

Participant: Just thinking about this, books - I like to buy books in a shop.

Participant: Just because I like to know I'm going to enjoy the words, so to speak. So I'll always read a few pages before I decide to buy. But if I enjoy the author then I might to buy more books online.

Actually, the same probably applies to clothes. If there's a brand I know I like then I will shop online after I've tried them at a shop. Car insurance, I shop about for and that's where the internet is so great because I can spend hours comparing the offers. I wouldn't dream of going to an independent insurance broker in RL. I would prefer to have it in my control.

Participant: I'm cynical of RL brands in SL.

Participant: So I would probably give them a wide berth to be honest. I find it frustrating that companies have the view that SL is yet another resource to be exploited. Which it is but I resent

having more advertising, more product placement imposed on me. Although, to be honest, it is easier to avoid because you don't have to visit the sims.

Participant: A bit of both really. I escape to SL. In SL I am ageless, I have infinite cash, infinite spending power, no responsibility - so it is 110% escapism, but also - I find advertising insidious in RL.

Participant: I hate it and I resent that it creeps into everything.

Participant: I would be happy to see RL companies leave SL. I think too the younger users, perhaps are more susceptible to RL branding.

Q Emotion

Participant: And that RL SL crossover like you used to be able to buy some SL clothes that would then be delivered to you in RL. Oops sorry! I keep talking. I don't think I have ever considered shopping to be emotionally stimulating.

Participant: Thanks! It's good to have to scrutinise my SL, I think! I think RL shopping is more emotionally rewarding.

Participant: you have something tangible, a thing. But SL shopping is fun, because of the lack of guilt. OK an example: The other day I bought an alpaca, in SL. I don't need one, but it was there, it was fun, so I bought it. In RL I couldn't afford to be so reckless. Obviously I wouldn't buy a RL alpaca but you get the point. I have a responsibility to be financially responsible in RL and that doesn't exist in SL. That responsibility.

Participant: Absolutely.

Participant: I don't think so. As part of your research will you be visiting SL shops and malls?

Participant: It is fascinating.

Participant: Hmm. Is it okay if I give you some landmarks? They will be stores, either in 'towns' or on their own.

Participant: Aoharu are Japanese clothes and hair, very popular.

Participant: Hello.

Participant: Not in a town.

Participant: Sure.

Participant: Juicy a high traffic popular sim. Newport keys a shopping district, not high traffic.

Participant: Also check out Tableau and Creator's Pavillion. Too very different shopping experiences. Sorry I don't have any LMs for malls! Thank you. It's been really interesting.

Participant: Good luck with your research.

Participant: Thanks - you too, bye all.

Interview 10

Participant: Can we start now please? Thanks. Hello, by the way.

Participant: Its not a problem.

Participant: Pleasure to meet you.

End

Interview 10

Q1

Participant: Varied, lots of exploration initially, tried a couple of rp groups which didn't work out, mostly purchasing vehicles and using them now.

Participant: Role-playing, where people pretend they're in sci fi shows and the like, its pretty strange.

Participant: There was a Battlestar Galactica one and a Stargate one.

Participant: Mostly hanging around in sandboxes now rezzing various builds.

Participant: Moving from the inventory into the second life environment, for example, if I bought a car from a second life retailer, I'd go to my land or a sandbox and 'rez' it so I could drive it.

Participant: The social environment is getting worse, but I think the quality of products and the technical environment is improving.

Participant: There's an increasing amount of narcissism and snobbery, 'noob-hating' is at an all time high, and I think its simply the case that a lot of unpleasant people have joined, sadly.

Participant: Haven't a clue.

Q2 Retail

Participant: Mostly good, many vendors provide good customer support, and frequent updates to high quality products, much like any other software providers.

Participant: Usually, most vendors use a system called hippovend that tells an item to check for updates when its rezzed, usually they either fix bugs, which can occur in a frequently changing virtual environment, add new features, or add improved integration with other products.

Participant: Usually, XStreet is the quickest and most efficient means, once I had an experience where the vendor failed to deliver the product on payment initially, but this was due to a glitch in the automated delivery system and was quickly resolved.

Participant: Both.

Participant: They offer the ability to see the product first hand as opposed to just pictures in XStreet, which is good for more expensive purchases.

Participant: Many, for example, Spyker industries allow you to temporarily rez the vehicles on their land, which is a very good way to see if they're any good, some vendors provide free demos, usually for things like skins or shapes, where they force you to have a floating demo text over your head or something, both are good in their own respects.

Participant: Nope.

Q3 Info

Participant: SL shops, they enable you to view the product, usually without the influence of shopkeepers.

Participant: No, I find it irritating, some shops hire people to do that, usually for renting land and the likes.

Q4 Convenience

Participant: 2D, it enables you to view the most amount of products in the least amount of time.

Participant: How do you mean?

Participant: A shop in sl, since you don't have to leave the house.

Q5 Trust

Participant: Real life, despite the reliability of sl shops and online shops.

Participant: Because you never actually touch the products in sl and online, you can't evaluate the trustworthiness of the seller as you can in real life since sl doesn't accurately show the sellers body language and the like.

Participant: I like the payment system in SL the seller does not get you details, so it is completely safe. Also Linden Labs controls everything so there is an authority with complete control which can kick wrongdoers out. The internet outside SL is like the wild west, so I only buy from big brands.

Participant: The closer SL gets to reality the more you will trust it since you will feel you are dealing with another person as opposed to a software program.

Q6 RA

Participant: Compared to real life? Its only convenience really, that said, I'd never purchase something real using the second life environment.

Participant: In my experience, technical issues are more quickly resolved online than in real life, since the product doesn't need to be sent away for maintenance.

Q7 Purchasing stages

Participant: 2D, real life, real life, second life.

Participant: The aforementioned technical issues, the fact that there's no hours waiting for customer support at a call centre, the ability to contact the creator directly.

Participant: Its just the speed second life allows really.

Q8 Simple and complex products

Participant: 2D, purely because of the increased amount of data that can be viewed in a reasonable amount of time, actual negotiation only occurs in the SL environment for land auctions, and real life deters from the process due to shopkeepers 'holding all the cards'.

Participant: Rare, there's little need to own land privately in sl for great expense when its available for free, albeit temporarily, in sandboxes.

Participant: Its usually through auction, that's the closest there is to negotiation, and then its just price.

Q9 Emotion

Participant: Real life, the virtual interpersonal barrier pretty much removes any emotion from purchasing online or in sl.

Participant: SL wins out of the two, you can actually view the products with other people, even if they are just virtual representations, whereas despite being incredibly efficient, 2d shopping involves

practically no emotion.

End

Interview 11

Q1

Participant: Fairly positive, it's been a very useful tool to me. Both with networking and creative media.

Participant: Yes, I help to run events and competitions here, as well as custom textures and builds when asked.

Participant: I wish! This is a part time hobby for now, but once I get the skills I'd be interested in starting some kind of semi-solid business here.

Participant: Most of what's done is based around clubs, helping to host, or uploading streams, as well as offering 1 dollar for themed events, where avatars get to style themselves on say kids cartoons and so on.

Participant: It varies greatly depending on the club, it's area and who lives locally on the sim. Adding money into the equation helps the numbers. Though with success there's lag, so it's all relative.

Participant: Well, if we get good numbers, it means we get more folks appearing and perhaps trying harder to win the money, so they may use more prims, better textures and so on. It slows things down, which can make folks want to leave if it gets too much.

Participant: I think the new regulations on adult sims is going to hurt some businesses. But as a whole it's getting better, if only because there are more groups to meet. Public attention makes working here more credible.

Participant: Well, I end up attending the clubs when I'm not working in them, but I also like to collect avatars, or anything unusual that someone's made here. I like to take them apart, tweak them and so on. But with the funds from the clubs and custom builds.

Q2 Retail

Participant: Again fairly positive, as long as things are represented properly and easy to access, it's all good.

Participant: Mainly avatars, so a mixture of skins, heads, sometimes scripts so I can have a go at making my own things.

Participant: Yes, though with XStreet things are easier, if only because not all creators have vendors in-world.

Participant: They weigh up about the same. In 3D you have a better chance of seeing an example, but 2D means you don't get stuck under a staircase in a laggy building that represents a mall.

Participant: Not often, my connection doesn't agree with them, and it's hard to navigate when the building itself isn't scaled up. We can fly, we don't need stairs and so on.

Participant: What do you mean?

Participant: So to your real door, or virtual representations of the real clothes?

Participant: Ah. I think I'd consider it, but I'm not sure.

Participant: Books more likely, so yes.

Participant: I think doing it here would maybe put you in an environment where there is someone right there who can talk to you about it. Though I'm not sure it would make things any better. Just different.

Participant: Very! To be able to have something of a live conversation about it, say if it were a book. I think that would be a positive experience.

Participant: Alrighty.

Q3 Info

Participant: I'd say 2D internet, I think.

Participant: For the most part it's useful, but it would be better if there were an area to read product reviews in-world. Since it might have everything it lists in the features. But it may not be very good still.

Q4 Convenience

Participant: 2D again I think, it's quicker.

Participant: Possibly SL, I rarely get time during the day in the real world to go shopping. SL never closes.

Q5 Trust

Participant: Real world, I think.

Participant: 2D, I am more likely to get support with a problem on say Amazon, than I am with SL in past experience.

Participant: In most cases on SL, what is sold is no transfer, so you cannot be refunded for anything. You cannot exchange anything etc.

Participant: If they refund you, then you still have their product. All they'd really have is your word that you've deleted it. People could abuse that. To get free products.

Participant: No just that, otherwise I trust SL. It also has the advantage that if something goes wrong you can go to Linden Labs and complain. They have details on everyone so they could follow it up.

Q6 RA

Participant: You don't have to own a business to set up a vendor, you don't have to be rich to buy the products, for the most part it's possible to see examples first, and most of the time the creators are willing to offer advice, If you have a problem with their wares that don't involve needing a refund.

Participant: Sorry!

Participant: Yes it does. The things I buy tend to be the more unusual things that I don't see much. Or things that have been made using different methods or styles. Because I want to learn how they did it, so I can use it in my own work. Elements of it, at least.

Participant: Oh dear.

Q7 Purchasing stages

Participant: Well, determination might fit easily into all three, If that's an alright answer. Vendor selection can be more difficult in real life depending on where you live and what transport is available to you. So I suppose 2d. Vendor selection here is easier if only because there are a few names that everyone knows, and so they're easy to find. I am a bit undecided on that one. SL. Purchase in SL is very easy if you earn here, since it's just a matter of clicking twice without entering any details. After sales service on SL is the best, so long as you do not want a refund, otherwise I would say RL, since it's easier to discuss an issue with somebody face-to-face than it is to play tennis with emails. So perhaps RL.

Participant: The creators are often around to help, and most vendors have groups set up, so anyone can begin a group discussion on a product, and other customers can join in and offer advice too.

Q8 Simple and complex products

Participant: Well, since anyone and their cat can set up a business here, I'd steer away from complex products on second life, and would much rather focus on RL companies found through 2D means. Being able to negotiate with a real person in SL is a benefit. Sometimes you can talk to the creator of the product and they will answer any questions you have so you can be more confident about what you are getting into.

Q9 Emotion

Participant: To buy something from a real person, and be able to interact with them even if it's as simple as a remark about the weather is a much better experience. Nothing can replace that, It's just convenience that makes me go elsewhere.

Participant: SL, since there's still some element of communication, Creators here are not automated to give set responses when you ask them a question.

Participant: I cannot stand getting emails like that when I need help on something 2d. I want to talk to a human.

End

Interview 12

Q1

Participant: OK. Overall very good. I like meeting new people, socializing, its fun, it is what makes me keep coming back.

Participant: Yes, I have made some good friends here which I meet up with regularly but I also like meeting new people. I like going to a party and talking to someone, just like in real life.

Participant: I do it in real life too, but it is also fun in sl. It is easy I can log in whenever I want. Also it is easier to approach someone in SL.

Participant: I can talk to someone anywhere, but it is easier to connect over a common interest like music, or an exhibition. Also if it is a party you can dance with someone which I like.

Q2 Retail

Participant: I love it, I love going round the shops, buying clothes, shoes, hair and so on and then putting them together. It is fun I can reinvent myself as many times as I want, whenever I want. Sometimes I'll meet up with my friends and go shopping together. It depends, other times I will just go on Xstreet which has got loads of stuff. The more I learn about SL and the more things I buy the more careful I am. I look more at the quality of the product.

Participant: What do you want to know, why I use XStreet?

Participant: Well if I just want to find something then XStreet is the quickest way. If I want go around and explore SL, and do some browsing of products too then I will go around the stores and malls. Going shopping with other people is more fun. It is like shopping in the real world. It is also nice to get a second opinion on things.

Q3 Information

Participant: The most accurate and useful information. It depends on the product. Often it is the real world because you can touch things, and get a better sense of their dimensions, weight and so on. It is the same case for clothes, or shoes. For other things the internet because there is plenty of information, reviews and so on. You can research a purchase endlessly. SL is like a combination of both. You can see a product in 3D, try it on a model and you could get a lot of info on it. It is not always the case but I am thinking more about the potential of the medium rather than its current state.

Participant: OK, real world and the 2D web joint first, because they have different advantages, SL second, because it is not as good as them but combines features of them both. But it could change in the future. I think virtual world like SL are the future, you just need the technology to become good enough to realize what people want, what they imagine.

Q4 Convenience

Participant: For most things the internet, so the 2D internet, then SL and last the real world.

Participant: Well the real world is last because you need to physically go there. Anything on the internet I can access from my house. SL is more rewarding than the 2D experience but the 2D is more convenient.

Q5 Trust

Participant: Well, in real life you do not really need to trust the seller, at least in terms of the transaction. You still need to trust them in terms of the product. Online you worry about the transaction too. There are certain companies I use on the internet which I trust. I did not trust them at first but I trust them now since they have been pretty much trouble free whenever I bought from them. So I do not necessarily trust the internet, but I trust those companies. SL has the advantage that if you had a serious problem you would go to Linden Labs and they would look into it. They control who operates in SL so they could ultimately ban them.

Participant: Yes I think so. People know this. If you have made a sizable investment to set up a store you do not want to defraud someone and risk being kicked out of SL.

Q6 RA

Participant: The first thing has to be that it is a new experience, it is something different. It is more fun than an ordinary website and it is convenient since you can use it from home.

Participant: I was talking about the purchasing process. I cannot think of something more specific.

Participant: Your welcome.

Q7 Purchasing stages

Participant: No problem, fire away!

Participant: OK. Requirements determination. I have never thought of it that way. For requirements determination I think all three have different advantages and disadvantages. So 2D and SL have the convenience. 2D is also the most efficient, so if you want to compare products I would choose two dimensional websites. So if I just wanted to buy something for requirements determination I would choose the internet, the two dimensional internet. What was the next one, purchase?

Participant: Once I have chosen what I want then it is just about price. So if I wanted to buy a DVD and I knew which one I wanted I would buy it from the cheapest place. Or if they had something else to offer. Sometimes HMV will have a special edition of a film, with a nicer case, more extras, a poster and things like that. In such a case I would get it from HMV.

Participant: Isn't it the same with vendor selection, if I choose who to buy it from then I buy it from them, don't I?

Participant: Right, OK. The payment in SL is probably the easiest, just two clicks, no filling in your

card number and so on. It is slightly quicker and easier. Also since you have already purchased the Linden Dollars you have already made the decision in your mind to spend them.

Participant: For after sales service, hm. If I wanted to return something I would like to send an email or a letter. If I wanted help to solve a problem, or help to show me how to use it then I would prefer something more direct like the phone or SL.

Participant: If I have a problem I want someone to help me, straight away, I do not want to go into town or send an email.

Q8 Simple and complex products

Participant: For the simple product like a book the 2D internet for sure, unless I happen to be near a bookstore. For a complex one like with the after sales service I would want to talk to a person, so the offline shops and SL. But then websites are good for comparing different deals so I would say that I might use a combination of them. I might use 2D to narrow down my choice and then want to talk to a real person, so maybe a website first then a real shop or SL.

Participant: I try.

Participant: I'm not in a hurry take your time.

Q9 Emotion

Participant: The richest emotionally. First the real life shops for sure as there are real people, music, you can touch things you can have lunch, you have so much stimulation and so many options. Then SL because it tries to emulate real life and it achieves it to some extent. Last the websites because they only have images, nothing else.

Participant.: Yes SL is usually more emotionally stimulating.

End

Appendix F: Survey data

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	3	5	2	3	5	135	83	99	50	1	26	1	25	33	13	29	34	29	38	31	36	25	32	45	31	50	34	16	-16	36	39	16	32	6	41	21	43	13	19	39
2	3	3	1	1	2	200	86	81	62	1	16	1	31	35	41	39	30	31	17	32	21	30	19	24	16	41	12	23	31	29	19	16	14	24	24	16	31	16	23	27
3	2	2	2	2	3	10	0	40	9	1	10	2	-20	-50	-30	-20	-50	10	50	-20	10	-50	20	50	-25	-30	50	-20	-50	50	25	-50	50	-21	-50	50	20	-50	50	50
4	6	4	2	2	3	200	0	100	100	1	50	2	0	0	50	0	50	50	0	0	0	0	-50	-50	-50	50	-50	-50	50	-50	-50	0	-50	-50	0	-50	-50	0	-50	-50
5	4	3	1	1	1	1	0	0	9	1	10	2	0	-20	-30	-10	-30	21	0	0	0	10	0	0	10	5	0	0	0	10	20	20	0	-11	-20	50	20	21	0	0
6	3	3	1	1	3	70	10	30	30	1	41	1	44	12	16	6	41	45	45	50	20	44	7	-13	21	36	-14	5	11	-14	14	23	-13	23	23	-13	23	24	-15	27
7	3	3	2	2	1	23	49	50	8	1	20	2		-21	-21	21	40	20	50	-20	29	29	-20	-30	-10	19	20	-9	-21	29	-29	-10	40	-20	-41	50	-29	10	28	10
8	3	3	1	1	3	40	0	10	5	1	10	2	0	0	0	0	0	0	0	0	0	0	0	18	9	34	17	5	23	29	11	14	14	-16	5	-13	12	-14	7	10
9	2	2	1	1	4	200	54	65	67	1	0	2		24	-23	12	6	24	28	4	24	25	5	40	18	31	47	33	27	35	34	37	33	29	25	34	35	35	15	3
10	6	4	1	1	3	48	40	30	30	1	50	2		50	-30	50	50	32	-14	-9	32	-10	-8	24	25	50	24	22	50	23	25	49	24	25	50	26	25	50	26	24
11	4	3	2	2	4	72	29	10	8	2	22	2	19	-11	19	40	40	41	23	-12	31	32	22	-1	19	32	11	20	30	9	31	40	9	30	32	9	32	43	15	20
12	2	2	2	2	1	40	30	100	57	1	50	2	0	0	-50	50	21	30	39	-50	14	-50	-50	20	26	16	43	35	-50	21	18	-44	50	29	-50	22	21	-50	50	42
13	4	3	2	2	5	111	30	50	20	1	41	1	40	10	-10	20	10	30	-31	-31	10	-21	-20	-10	10	10	31	10	-21	31	31	30	21	10	-20	50	50	21	50	41
14	3	3	2	2	2	108	19	45	8	2	20	2	20	19	20	31	30	30	31	31	30	27	28	-20	20	20	9	30	22	11	36	20	17	32	20	24	17	19	19	16
15	2	1	2	2	4	200	0	50	50	1	50	2		-50	-50	-50	-31	-50	30	-30	50	-20	50	30	-50	20	50	10	-50	50	40	20	50	10	-20	50	-20	-50	50	20
16	5	3	1	2	4	55	0	81	18	1	24	2		0	10	20	40	41	0	-1	-1	0	-31	30	19	20	10	9	-50	50	30	-50	10	9	-50	49	29	-50	26	50
17	3	1	2	2	1	125	0	100	50	1		1	31	-21	20	30	11	41	9	-32	9	-11	-11	11	9	41	-21	-11	-32	31	40	50	-20	-21	-31	34	45	39	11	31
18	2	2	2	2	3	50	10	25	20	1	40	2		-10	-10	-30	10	50	-10	5	10	2	2	3	40	30	10	15	6	15	50	41	-5	-5	-5	50	30	30	30	50
19	3	3	1	1	4	27	8	70	18	1	41	2		20	4	-32	20	30	31	20	40	31	5	10	20	30	4	40	3	39	39	9	31	30	4	40	40	30	30	30
20	5	3	2	2	3	151	9	40	91	1	41	2	21	-21	-41	-41	-20	-10	0	-21	20	-40	0	-10	20	41	9	10	-40	10	31	30	0	0	0	49	31	21	0	40
21	5	3	1	1	3	45	0	95	5	1	15	2	0	-50	-50	-41	10	20	-20	-41	-1	-41	0	-30	10	-20	-31	25	-20	-10	30	-41	26	15	-41	50	36	-30	-20	41
22	4	4	2	2	5	124	0	80	9	1	50	2	0	0	20	9	0	20	0	0	10	0	0	0	0	40	-41	-41	0	0	0	41	-41	-41	0	0	0	40	41	0
23	5	3	1	1	4	83	0	100	49	1	40	2	0	0	0	10	11	0	2	0	0	-2	0	0	0	7	0	0	0	-1	0	0	0	0	0	0	0	0	0	0
24	6	3	2	2	3	102	0	90	0	1	49	2	-50	0	0	0	0	0	20	20	21	0	0	0	31	10	0	42	0	30	30	31	11	41	-2	50	50	41	49	49
25	3	3	2	2	1	37	38	69	9	1	22	2	-1	-31	-30	11	15	-3	20	-21	10	-40	-10	20	34	16	23	17	29	29	20	39	23	32	23	29	38	29	23	21
26	3	3	2	2	1	29	6	20	23	1	7	2	6	13	7	25	6	22	8	23	26	23	6	18	15	11	19	26	25	19	21	17	25	28	37	29	26	20	26	35
27	2	2	2	2	2	3	0	34	24	1	50	2		-50	-10	-50	-50	50	50	50	20	-31	50	14	50	-50	20	50	-50	30	50	-50	50	28	-50	50	50	-50	10	50
28	2	1	1	2	4	51	8	60	48	1	21	2		20	11	19	41	10	9	10	30	-12	-42	9	31	41	-10	-10	-10	-10	-10	-11	-11	-9	-9	-10	-11	-11	-10	11
29	5	4	1	1	4	70	1	50	19	1	50	2	0	0	0	0	31	20	50	0	30	-31	0	41	10	-20	41	11	-31	50	50	0	40	21	9	50	50	0	50	50
30	4	4	1	1	2	74	0	5	95	1	50	2		-50	-50	0	0	50	50	-50	-50	-50	50	19	10	-10	41	-10	-30	48	28	-20	39	16	-11	40	14	-14	21	41
31	2	2	1	1	2	23	80	15	5	1	30	1	30	10	5	30	15	30	15	10	25	15	-10	30	20	10	41	24	10	20	20	10	20	20	10	4	3	2	31	20
32	3	3	2	2	3	47	0	50	0	1	41	2	0	0	0	20	50	10	50	0	50	0	0	-2	30	30	31	30	-1	20	41	0	40	41	0	50	50	0	50	50
33	4	2	1	1	4	49	83	86	89	1	17	2	15	41	43	43	50	50	-10	-41	-38	-50	-50	21	30	39	-20	-22	-41	25	20	16	-44	-45	-46	19	20	21	50	50
34	3	2	2	2	5	5	0	15	30	1	35	2	0	-7	-5	20	30	-17	40	29	30	23	-25	8	19	20	5	3	7	-14	-14	-14	-14	-13	-18	-14	-11	-25	-8	-16
35	3	3	2	2	4	70	6	62	78	1	44	2		-22	-50	28	24	30	50	-32	12	-20	39	-50	13	47	-50	9	-50	7	41	-50	5	24	-42	20	25	-50	22	34

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
45	22	33	47	14	-7	11	27	38	23	20	41	36	26	17	38	34	17	32	36	16	33	34	14	40	23	29	26	50	22	45	23	46	33	24	38	35	40	45	34	
19	31	27	36	30	22	40	23	28	38	32	31	24	26	22	26	21	26	36	34	23	27	23	26	37	42	36	36	35	40	34	27	42	39	31	36	41	37	24	27	
-50	50	10	-50	50	20	-50	50	21	-50	50	-50	-50	50	10	50	10	20	50	-10	-10	-10	-50	20	40	-50	30	-10	10	20	-10	-50	10	50	30	21	20	-50	30	30	
50	-50	-50	50	-50	-50	50	-50	-50	0	-50	-50	0	-50	-50	50	-50	-50	0	-50	-50	0	-50	-50	50	50	0	0	0	0	0	0	50	50	50	50	50	50	50	0	
0	0	0	0	0	0	0	-2	10	11	0	1	1	21	20	20	50	50	50	0	0	0	10	-20	-10	-10	-10	-20	-20	20	10	0	0	11	0	10	-10	10	0	0	
29	-15	24	25	-15	30	30	-16	19	20	-16	28	12	-19	38	38	-18	31	42	-16	27	29	-15	-10	-9	40	2	20	2	40	-10	41	41	38	34	32	33	44	4	31	
19	50	0	10	38	10	30	50	9	31	50	-30	-9	31	19	50	40	21	50	30	50	20	10	50	0	-20	19	-42	30	20	0	0	0	-30	0	30	-9	30	-11	29	
25	18	-22	26	-23	12	-10	-19	20	-12	-11	23	15	14	-17	4	-6	3	16	-9	18	-10	9	-14	4	8	16	23	-19	25	29	-11	8	-16	15	11	-6	35	-26	-18	
41	33	26	27	50	6	20	34	27	42	49	1	4	50	15	17	28	19	33	27	19	44	-23	6	-17	25	30	8	7	27	15	-37	-35	-36	-34	-11	-7	41	12	23	
48	26	24	50	25	24	49	24	23	45	25	24	47	25	25	45	26	25	47	25	25	43	25	25	48	32	22	37	34	44	27	5	7	6	7	37	25	50	24	37	
39	22	33	48	10	40	48	8	33	47	-9	-11	-8	-7	-8	-9	-7	-6	-7	10	21	42	-8	30	41	10	18	28	21	21	21	19	26	30	28	38	36	37	34	34	
-50	50	50	-39	50	50	-50	50	50	-50	50	34	-50	50	50	-37	50	28	-31	50	50	12	50	32	-35	19	19	50	50	-32	-33	42	32	-50	-50	-23	-25	-33	12	22	
20	50	30	20	50	30	10	50	50	50	50	20	10	50	50	50	50	50	50	40	20	20	30	30	10	-10	21	-19	9	10	-10	-19	-19	-29	-9	-40	-19	-9	-9	-19	
25	26	14	20	17	15	29	28	17	10	11	24	12	17	13	12	19	20	18	18	16	16	13	19	18	41	38	40	39	36	35	35	21	30	31	30	30	28	28	28	
-50	50	50	10	10	40	20	50	40	30	50	-50	-50	31	21	50	-50	-50	-50	-50	-41	50	-10	10	10	20	-20	-20	-10	50	-11	10	50	-10	-10	-10	-10	50	50	50	
0	30	30	20	30	30	30	20	19	20	41	20	0	10	19	20	10	20	30	0	20	30	-11	0	10	0	0	-32	10	20	0	30	30	20	-11	-11	-11	40	40	40	
30	9	31	27	15	22	9	20	40	10	22	31	11	32	39	30	25	25	50	17	21	45	32	41	28	40	33	33	41	49	21	50	50	39	32	16	22	33	32	47	
50	30	40	40	-50	-5	10	10	25	25	10	-10	10	25	25	28	40	40	40	-5	-5	-5	50	-50	-25	-3	10	-10	-10	50	-5	50	5	-25	-10	20	20	5	35	40	
19	39	40	14	41	40	10	30	30	30	30	30	5	19	25	19	12	15	35	11	21	21	12	1	15	40	40	11	41	19	30	31	31	41	40	29	30	41	40	12	
21	41	41	21	41	41	31	50	50	50	41	31	0	0	30	41	0	20	41	10	20	30	0	-11	-11	19	21	30	10	41	30	30	31	36	32	28	28	50	50	50	
-31	10	50	-30	20	10	5	10	41	-21	20	10	-50	-20	30	-41	-20	41	30	-1	10	5	-30	31	-50	10	10	-20	-20	0	-30	-10	10	-41	-50	0	-10	-10	-40	-11	
0	41	0	40	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	-11	-21	-21	-21	50	0	0	0	0	-11	-11	-11	40	30	-11	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	2	4	3	3	2	2	3	3	2	3	2
50	32	50	12	50	49	50	50	50	11	10	50	9	50	50	19	49	50	10	50	49	49	40	20	20	0	50	50	50	30	50	0	0	0	0	41	31	49	50	19	
33	22	31	23	42	25	20	43	42	36	23	29	17	18	39	35	11	19	36	24	21	36	29	41	23	-9	20	10	12	25	13	5	29	41	29	-9	-8	23	9	19	
37	28	34	37	21	17	14	18	19	40	27	16	25	24	12	14	21	34	33	23	24	23	25	22	36	22	26	24	12	23	14	13	35	34	18	14	13	14	34	32	
-50	31	50	-50	50	18	-50	15	50	-50	26	50	-50	50	50	20	0	0	0	50	18	21	11	-50	23	-50	-50	-48	-50	50	50	-21	-21	-37	16	0	0	50	50	50	
10	10	11	10	9	11	11	10	10	20	11	12	18	9	22	30	-10	10	10	11	10	10	-11	-10	11	10	20	32	30	32	31	32	27	49	39	29	29	29	18	16	
0	50	31	0	50	30	0	50	50	21	50	10	0	50	20	11	21	50	29	0	30	0	-21	20	0	0	0	-21	20	50	22	50	29	21	0	20	0	40	20	50	
-10	41	19	-29	31	-20	10	41	30	-10	41	-11	-20	21	30	10	10	21	30	-10	21	30	-41	-31	-20	-25	24	-25	15	32	23	25	46	21	31	16	24	40	29	-14	
10	31	20	10	41	26	10	31	20	10	20	14	9	29	18	10	-13	-7	-2	-21	-11	-5	10	19	29	-21	-20	-11	10	10	11	13	-4	-31	-15	-10	-9	-10	14	20	
50	49	49	49	41	41	1	0	40	40	50	49	-1	50	50	50	40	41	42	0	0	50	0	0	0	50	50	20	20	20	21	20	20	20	21	21	21	21	21	21	
50	6	50	50	50	50	50	9	50	38	32	21	-19	19	50	50	12	50	31	18	45	37	7	41	38	-11	25	-11	18	45	13	46	29	29	50	-10	-11	33	34	20	
-23	20	26	33	-14	-20	14	-19	-23	-25	-18	-19	-25	20	26	27	-15	-19	-34	-17	-19	-24	-12	-16	-24	27	25	37	33	24	-19	-16	-22	-29	-28	29	27	20	35	25	
-50	21	-17	-50	20	16	-50	16	16	31	-19	13	28	17	-20	17	18	-16	17	19	10	-33	19	-20	22	34	17	50	-11	13	30	-17	21	18	17	-24	5	-2	31	32	

81	82	83	84	85	86	87
44	37	43	47	25	43	36
15	27	22	26	14	19	22
-50	50	50	10	10	-10	50
50	50	0	0	0	0	1
11	-9	-50	0	10	10	10
5	49	27	47	45	50	30
-10	40	0	30	0	39	-10
-31	17	-23	16	-12	18	20
13	27	32	22	28	4	-15
27	-10	-10	33	38	50	50
37	27	37	41	40	40	24
19	47	19	17	19	21	15
9	30	19	40	19	30	30
28	31	30	29	28	29	30
50	50	50	11	9	50	50
20	50	50	50	50	40	40
33	30	22	31	27	50	50
-5	3	3	10	1	4	45
17	10	10	20	20	48	47
50	50	49	34	35	47	46
-41	10	10	0	0	15	0
12	20	-12	0	0	0	0
3	2	2	2	3	2	3
47	50	49	19	41	50	50
12	15	32	13	6	15	9
20	17	19	38	34	30	16
-50	50	50	-21	-23	24	22
26	24	26	39	18	18	34
20	50	20	50	50	50	30
-15	48	45	44	43	48	46
8	11	9	10	10	10	10
21	21	21	20	21	21	21
13	11	14	50	50	50	50
14	10	13	31	24	9	-6
-15	-7	30	40	50	7	-9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
36	2	2	1	1	2	100	11	28	46	1	13	2	-1	8	-18	-19	-29	28	36	-27	28	-45	5	16	36	13	12	24	5	30	14	-7	50	30	-11	50	15	-11	50	39
37	3	3	1	1	4	35	9	35	3	1	20	2		10	20	30	30	20	20	20	30	20	-20	20	40	30	19	40	19	40	40	21	40	31	20	40	30	30	30	40
38	3	3	1	1	4	0	0	0	0	1	-50	2	-50	0	1	-21	-20	13	-26	18	-6	-28	11	9	20	21	-10	-23	-9	12	-16	17	-23	-12	-9	39	-28	21	-12	-32
39	7	8	1	1	5	20	50	40	19	1		2		0	0	0	0	50	0	0	0	0	0	0	41	0	40	-50	-50	0	50	40	41	-50	-50	50	-50	-50	0	31
40	2	2	2	2	4	76	2	60	92	1	38	2		10	0	29	40	49	20	50	50	-12	-19	9	10	9	12	-2	0	14	0	0	6	0	12	4	-14	-22	0	5
41	6	8	2	2	3	200	0	28	28	1	9	2	0	0	50	30	50	50	20	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2	1	1	1	7	200	9	40	48	1	30	1	21	19	30	-10	50	19	50	20	20	30	19	0	0	50	0	0	50	1	0	50	0	0	50	0	0	50	0	0
43	4	4	1	1	2	125	18	90	19	2	30	2	21	20	20	20	20	21	20	41	41	9	42	20	20	30	19	20	19	21	21	20	22	20	22	29	19	21	19	31
44	5	5	1	1	3	8	0	100	0	2	0	2	0	0	0	0	0	0	0	-21	0	0	0	36	37	0	37	39	0	31	31	0	43	42	0	50	50	0	35	35
45	2	2	2	2	3	23	0	100	0	1	50	2	-1	-50	-50	0	50	0	30	0	10	0	-50	20	10	0	50	10	-50	50	20	9	50	10	-50	50	10	-41	30	50
46	3	3	2	2	3	106	20	50	100	1	41	2	0	0	10	0	10	30	40	0	40	-31	0	50	50	50	50	50	30	50	35	25	50	50	-31	50	50	-10	50	50
47	3	4	2	2	4	137	0	40	60	1	20	1	-50	-50	-31	-21	10	50	11	1	20	20	0	20	10	50	-31	-20	0	-21	-21	20	-31	-20	0	-31	-22	0	-31	-19
48	4	7	1	1	2	19	0	70	19	1	0	2	0	-50	-31	-41	-22	34	40	21	40	10	0	-25	20	-11	19	49	-42	29	30	-21	30	50	-21	50	40	-11	40	40
49	4	3	2	2	4	77	0	35	51	1	41	2	-41	0	19	9	50	20	0	9	-1	-21	-11	0	40	30	0	-1	0	1	10	-50	0	0	-31	0	49	10	3	40
50	4	3	2	2	2	200	50	100	99	1	31	1	9	21	21	20	20	21	20	10	9	20	19	9	11	10	40	-10	-11	20	21	-9	21	20	31	-11	21	20	-17	20
51	3	3	2	2	4	60	0	40	60	1	40	2	0	-30	0	0	0	40	-30	-30	40	30	0	40	40	40	40	-50	-50	50	50	-50	50	-50	-50	50	50	-50	50	50
52	2	2	1	1	4	59	0	26	6	1	28	2	5	9	20	12	11	11	14	11	14	-31	-19	10	5	15	2	-21	-21	2	7	-16	-17	7	-18	-17	8	-18	10	9
53	5	3	2	2	3	200	0	40	10	1	40	2	0	40	40	0	40	40	40	0	30	0	0	0	0	40	0	0	-10	0	0	30	0	0	-10	0	0	30	0	0
54	4	3	1	1	3	200	50	20	10	1	-31	1	-21	31	21	21	30	30	31	10	20	31	10	10	10	41	10	10	41	5	7	32	7	16	41	2	11	31	4	15
55	4	4	1	1	3	40	14	35	26	1		2		12	10	12	31	21	30	30	11	19	21	21	21	20	11	10	10	30	30	30	10	10	10	21	20	20	21	20
56	4	3	1	1	4	55	1	92	5	1	0	2		-49	-50	-26	16	-1	35	-50	-50	-14	-1	26	-26	-25	-16	-16	-17	50	40	40	-21	-21	-22	50	41	40	40	40
57	5	4	1	1	4	50	8	40	60	1	40	2		11	20	9	9	30	30	40	41	20	-10	9	29	41	42	28	-39	41	39	40	37	-23	-35	39	42	43	43	41
58	3	3	1	1	3	2	9	9	9	1	10	2	10	10	-10	10	10	20	10	-10	10	-21	-20	10	21	30	10	20	31	10	30	31	31	20	20	20	20	10	21	31
59	3	3	2	1	3	90	100	80	80	1	45	2	0	41	-50	10	50	-10	20	-10	31	0	-50	41	41	41	11	20	-5	20	20	20	10	20	-10	30	30	31	41	41
60	3	3	1	1	4	76	2	32	86	1	49	1	46	46	46	23	50	47	21	31	40	37	3	32	10	50	22	21	50	-8	21	47	13	12	50	6	50	50	6	50
61	3	3	1	1	3	22	1	30	9	1	21	2		10	-21	20	16	-21	36	-6	21	-41	-23	10	17	28	40	10	-35	35	18	-46	43	37	-45	40	32	-42	27	34
62	3	3	1	2	2	20	10	80	30	1	50	2		-50	-50	30	37	31	-21	31	50	20	-21	20	50	50	50	50	30	30	50	50	50	50	40	20	50	50	10	50
63	2	2	2	2	2	23	9	50	30	1	25	2		-50	-31	-20	30	20	-21	-31	21	-8	5	44	-12	-22	31	-40	-50	41	40	41	-4	-50	-50	50	41	40	36	50
64	3	2	1	2	2	24	3	23	11	1	-15	2	-17	10	12	-17	9	7	8	-9	-15	-10	10	10	15	30	-5	-16	18	-6	8	-13	4	9	14	9	-10	-30	5	-6
65	4	2	2	2	3	15	0	100	9	1	50	2	0	0	0	-10	4	0	21	-6	10	0	-11	0	0	20	0	0	11	0	0	10	20	20	20	20	20	21	20	20
66	5	3	1	1	4	1	0	0	0	1	-10	2	0	3	-50	15	-39	39	46	13	31	11	-13	41	50	16	31	16	-50	50	50	4	50	25	-50	50	50	23	50	50
67	7	3	1	1	1	7	0	100	0	2	-31	2	0	0	0	0	0	0	41	-10	20	-30	20	20	20	-50	-50	50	-50	50	50	-50	0	50	-50	50	50	-50	50	50
68	6	5	1	1	4	49	0	8	8	2	0	2	0	0	0	0	0	0	0	-1	-1	0	0	-32	-21	0	-1	0	0	-31	-31	-32	-40	-41	-42	-33	-41	-32	-41	-12
69	3	8	2	2	2	33	0	16	0	1	13	2	0	-7	9	18	33	30	50	15	29	0	12	24	34	17	42	34	15	50	46	10	50	10	-10	50	50	-10	50	43
70	4	4	1	1	6	99	50	9	30	1	50	1	50	50	41	31	50	50	20	21	41	10	-10	50	50	50	-50	50	-50	50	50	41	0	0	0	50	50	41	31	50

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
11	50	23	11	25	27	10	34	24	7	50	4	-20	34	18	14	16	50	38	-7	12	28	-22	-11	12	19	-14	6	-25	34	33	-20	-22	-31	20	17	18	7	9	-33	
10	30	40	10	40	30	10	40	10	10	41	30	10	30	20	10	30	20	10	20	30	10	20	30	10	20	30	30	30	10	20	20	10	10	10	10	20	20	20	10	
18	17	-16	-6	31	20	9	-19	-6	12	11	-20	16	-23	6	9	13	32	-21	29	-24	-14	-23	-15	-6	20	-31	-18	50	-18	20	-28	-50	10	-28	-26	-15	19	-25	17	
31	50	-20	-21	50	50	50	50	-41	-50	50	50	50	50	50	41	0	29	29	21	20	-20	0	0	0	20	0	-11	20	10	0	-11	-11	-12	-15	-32	-30	21	0	0	
5	38	-13	-17	19	-19	36	33	-18	-11	20	-18	-22	29	-9	-14	12	-13	-15	17	-8	50	21	-26	29	50	50	41	41	30	30	20	27	50	50	41	20	50	41	31	
0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
50	0	0	50	0	0	50	0	0	50	0	0	50	0	0	50	0	0	50	0	0	50	0	0	50	31	50	50	49	50	50	50	50	50	50	50	50	50	50	50	
31	22	29	32	20	30	29	30	28	30	31	20	31	19	31	32	22	28	37	20	28	31	30	18	30	40	9	11	-11	33	18	22	24	22	19	20	21	20	20	22	
0	50	0	0	50	0	0	50	29	0	50	0	0	50	0	0	30	0	0	0	0	0	0	0	0	0	0	0	-1	0	1	0	0	0	0	0	0	0	-1	0	0
-50	50	50	-50	50	-50	10	50	50	-11	-31	50	50	50	50	-31	0	11	50	15	32	50	0	0	0	21	35	-50	33	50	0	-11	0	49	45	-34	0	42	47	0	
41	50	50	50	50	50	40	50	50	40	50	0	0	50	0	20	50	0	50	30	0	30	25	25	50	0	30	-50	50	50	0	0	0	0	40	-50	-50	-50	50	50	
0	-32	-21	0	-21	-20	0	-21	-19	0	-21	-21	0	-21	-20	9	20	20	20	0	0	9	0	0	20	40	30	10	0	19	10	10	9	0	0	10	10	20	10	21	
-21	30	30	-11	30	30	19	50	39	10	50	50	-32	19	-30	-30	50	50	50	-22	-21	-22	-33	-22	30	-20	-22	-22	20	20	-39	9	-47	-50	-50	31	30	-50	-50	19	
2	20	20	0	20	20	9	0	50	0	50	0	0	49	49	49	9	10	50	9	10	50	25	0	0	-22	20	0	11	30	0	40	26	0	0	30	30	30	10	0	
21	-19	20	21	-12	22	21	11	10	10	14	-11	11	11	-10	11	13	-20	-20	-10	-10	-10	11	11	10	11	-10	10	11	9	11	11	-9	11	10	11	20	12	21	-16	
-50	50	50	-50	50	50	-50	50	50	-50	50	-50	-50	-50	50	50	-50	50	50	-50	-50	-50	0	0	50	-30	-30	-30	-30	40	40	50	50	0	0	-10	-10	30	30	0	
7	7	7	5	-9	7	-10	11	6	-8	-12	0	12	8	-16	9	-8	-14	-9	12	12	8	9	-14	8	16	-18	26	-18	16	1	7	8	-12	-15	25	-22	20	20	0	
30	0	0	30	0	0	30	0	0	30	0	0	-10	0	0	20	0	-1	20	0	0	30	0	0	-10	10	10	0	0	20	20	20	20	20	20	10	10	20	20	0	
39	3	14	39	7	10	25	7	18	36	3	24	40	2	13	35	3	12	36	5	23	36	3	5	29	-10	-10	-31	-7	-10	-10	11	7	-8	-10	-10	-8	0	-20	-14	
20	20	20	20	31	31	31	22	21	21	22	20	20	41	41	41	29	31	31	22	21	23	-11	-10	-11	21	21	21	29	32	30	0	0	0	0	11	10	31	32	31	
40	50	30	20	30	40	20	50	40	40	-15	-15	-15	-1	-1	-1	1	1	9	1	1	1	10	10	10	-1	-1	1	1	1	1	-42	-28	-42	-42	1	1	-10	2	-3	
41	40	43	11	38	38	-17	41	41	17	41	24	-21	39	35	39	22	42	45	11	30	45	-30	-34	-10	20	8	44	9	43	20	41	16	41	31	-8	-11	36	30	10	
20	30	31	30	24	24	30	22	25	18	21	18	21	19	19	21	20	21	26	11	20	30	21	18	12	14	-12	16	-11	14	16	15	12	28	12	25	12	25	14	24	
41	41	41	41	41	40	41	41	41	41	30	20	-10	31	-10	41	31	29	41	31	36	41	2	7	11	41	41	-6	5	46	41	3	4	3	4	11	9	15	16	30	
50	4	12	50	5	14	50	5	8	50	4	24	50	6	42	50	5	50	50	5	4	4	8	5	4	50	50	34	50	50	50	50	41	50	50	47	50	50	50	50	
-13	33	23	-28	31	15	-27	38	25	-40	41	32	-39	29	17	-30	44	21	-34	10	5	-19	-41	-21	36	-21	-22	-24	-21	-21	-13	-35	-16	-38	-22	-33	-32	-15	-17	-11	
50	31	50	41	10	50	30	20	50	50	-21	50	50	50	10	50	30	10	50	0	17	31	40	-28	-36	41	50	21	50	50	31	50	0	50	20	50	50	31	50	31	
9	45	41	10	44	16	30	43	43	43	30	16	2	50	44	40	44	33	50	41	31	48	3	34	15	21	46	-13	37	41	-8	4	-4	-43	-3	-3	18	30	47	33	
4	-3	5	-8	-4	5	10	-4	5	8	8	5	10	4	8	10	8	6	10	7	3	9	5	6	11	12	10	8	6	-6	9	-7	10	7	9	10	9	11	12	12	
20	20	21	20	21	21	21	21	21	21	30	21	20	20	41	41	21	41	50	31	41	50	0	0	0	21	20	-10	10	50	10	50	0	10	20	10	30	31	31	50	
-25	50	50	-50	50	50	-50	50	50	13	50	5	-50	37	15	6	18	19	31	50	23	18	-3	-33	44	13	24	15	14	-19	-21	-12	4	-11	-2	0	0	-10	8	5	
-50	50	50	-50	20	10	0	50	50	0	0	50	0	31	32	0	-31	-31	40	20	21	0	21	-30	0	-30	-30	0	0	0	0	0	0	0	-22	0	0	-1	0	0	
-31	-32	-42	-21	-12	-23	-11	0	0	-2	-31	-41	-32	-20	-30	-21	-21	-32	-32	-31	-31	-31	-41	-40	-42	-31	-31	-40	-30	-40	-31	-50	-50	-48	-50	-50	-41	-41	-50	-42	
23	50	20	19	50	30	20	44	39	0	50	-50	-50	50	39	29	32	50	29	0	0	0	50	29	28	-10	34	8	24	19	0	0	-9	0	0	-6	21	6	28	-4	
31	31	50	31	-50	50	30	30	40	41	30	31	31	11	41	50	20	50	41	-50	50	50	-10	-11	-21	50	50	50	30	50	50	50	30	20	20	20	20	20	20	20	

81	82	83	84	85	86	87
-9	17	-17	-22	-31	18	10
9	21	20	10	10	10	11
-36	-18	12	-23	18	-21	-25
0	0	0	0	0	0	0
21	50	50	30	31	48	48
0	0	0	0	0	0	0
50	50	50	50	50	50	50
21	20	19	21	20	20	21
0	0	0	0	0	0	0
49	26	50	0	0	32	50
0	50	50	30	30	50	50
0	30	0	10	0	20	0
-50	50	50	49	50	35	26
0	40	40	39	20	31	30
22	8	10	11	11	10	10
0	-30	-30	-30	40	50	50
-2	-27	16	-23	33	14	-19
0	40	40	40	40	40	40
-15	-8	-14	-13	-16	-23	-10
31	32	31	22	20	20	18
-2	30	30	-7	-8	2	2
12	44	49	38	42	42	41
18	26	16	25	19	27	25
20	50	50	3	5	35	36
50	35	36	50	50	50	50
-28	11	7	18	10	29	37
50	50	23	50	10	50	31
0	50	46	46	-8	50	49
10	14	10	13	-5	11	21
0	50	0	22	20	31	30
21	3	3	-50	-50	-44	-44
0	0	0	0	0	0	-1
-41	-50	-42	-41	-50	-42	-50
10	40	30	50	50	0	50
20	50	50	30	30	50	50

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
71	4	3	2	2	4	42	0	81	20	1	31	2		-50	-50	-50	-31	20	10	-50	30	-31	0	31	30	-20	21	20	-31	50	50	-50	50	50	-50	50	50	50	30	31
72	4	4	1	1	4	4	2	4	19	1	10	2	0	6	5	6	9	10	11	11	17	11	10	5	4	6	5	9	10	6	9	7	9	6	7	6	7	10	10	4
73	4	4	1	1	3	16	2	50	50	1	20	2	1	10	1	22	20	20	-16	12	16	10	-11	5	41	4	13	50	-31	34	50	33	11	30	-12	50	50	23	18	50
74	4	4	1	1	4	14	0	80	5	1	25	1	33	13	-26	-21	24	9	11	-18	22	0	-12	20	26	30	25	32	0	41	24	20	23	30	0	45	35	14	6	39
75	4	3	2	2	4	38	0	40	10	1	32	2	20	0	1	5	11	31	11	0	1	0	0	21	29	20	41	-10	-10	21	21	9	31	-10	-10	20	20	0	30	21
76	2	2	1	1	4	14	0	86	81	1	37	2	0	0	0	10	9	50	50	-19	23	-31	0	40	50	24	43	50	-47	30	50	-50	50	42	-50	50	45	37	50	31
77	6	3	1	1	1	49	2	60	9	1	50	2		30	-50	-50	-50	50	-50	-50	-50	50	-50	50	50	50	50	-50	-50	50	50	25	50	-50	-50	50	50	25	50	50
78	2	2	2	2	1	121	0	70	29	1	31	2		-41	-31	10	20	0	20	-10	20	-41	-20	41	31	-10	-10	41	-11	50	41	-10	30	30	-50	50	30	20	-11	50
79	5	3	2	2	5	84	2	20	50	1	40	2	0	0	0	50	0	50	37	0	0	0	49	20	0	50	-50	-50	-50	26	0	-50	-50	-50	-50	31	-50	-50	50	-50
80	2	2	1	1	3	15	0	35	65	1	41	2		-40	-30	-40	50	40	30	-50	20	0	0	-40	40	39	40	50	-50	50	25	25	50	50	-50	50	40	40	50	50
81	3	3	1	1	3	49	0	30	39	1	20	2	20	-50	24	20	10	30	30	0	30	30	0	31	9	30	-50	-50	-50	-50	-50	-50	-50	-50	-31	-50	-50	-50	0	0
82	2	3	2	2	3	35	1	20	30	1	45	2		-50	-50	-50	-40	30	10	-50	10	-50	50	30	10	25	-25	25	25	50	50	50	25	25	25	50	40	40	40	50
83	2	1	1	1	4	24	0	30	40	2		2	50	50	31	40	50	50	50	10	31	-41	-50	20	30	41	45	30	40	50	30	40	45	20	30	45	20	41	46	30
84	2	2	2	2	3	75	0	100	30	1	32	2		-26	6	-9	12	16	50	27	22	25	22	28	0	40	50	-12	-28	50	29	-32	50	22	-42	50	34	-41	50	43
85	2	2	1	1	4	100	5	40	55	1	15	2	0	-23	-31	16	50	26	20	-35	20	-50	-13	0	40	20	14	-15	-36	46	20	-30	50	18	-31	50	30	-15	35	50
86	3	3	1	1	3	40	10	50	40	1	0	2		11	50	15	50	37	50	0	20	0	-10	50	50	50	50	-50	-50	50	50	0	50	-50	-50	50	20	0	50	50
87	4	4	1	1	3	30	1	49	50	1	41	2	0	30	10	-10	10	41	-10	-26	10	-26	25	10	41	20	41	-31	-50	41	41	41	41	-31	-50	41	41	41	30	30
88	6	4	1	1	4	110	20	71	60	1	30	2	-42	20	10	11	41	20	31	-11	-10	10	10	20	10	31	10	20	-31	30	20	10	21	10	-31	32	10	21	31	10
89	3	3	2	2	1	30	3	13	4	1	16	2		6	27	12	30	25	24	36	28	39	12	3	16	34	-3	-7	-30	-4	-10	-30	-4	-32	-38	-3	-25	-30	-3	-6
90	3	2	1	1	2	82	5	85	12	1	45	2	-45	25	5	5	45	45	45	15	35	15	48	45	15	45	45	5	2	45	35	45	45	5	2	25	25	2	42	25
91	5	3	2	2	2	10	100	0	4	1	41	2	0	20	-41	20	-41	41	10	30	30	36	-50	20	30	41	20	41	30	21	30	41	20	20	9	50	41	41	5	46
92	3	3	2	2	3	172	71	17	72	1	25	2		13	-17	-15	10	-21	-24	-12	8	-39	46	15	-17	19	21	21	-50	32	32	-50	38	32	-50	33	37	-50	-23	43
93	4	4	1	1	1	4	0	2	1	2	-10	2	-2	-50	-30	-30	34	50	25	-25	37	-36	0	23	30	-20	50	21	5	40	31	-31	50	22	4	41	31	-31	27	33
94	3	3	1	3	5	100	30	19	5	1	17	2	-23	31	15	44	50	30	50	0	10	-20	0	10	29	32	13	12	14	0	0	0	-20	-17	-50	-37	-36	-50	7	12
95	5	3	1	1	5	22	19	80	50	1	30	2	0	-50	-50	50	50	10	0	-40	-31	-11	-22	49	49	49	-11	41	0	41	40	42	41	40	30	41	41	41	40	41
96	2	2	1	1	2	7	0	80	19	1	50	2	0	25	0	0	0	0	50	0	20	10	0	50	50	50	0	-20	-50	50	40	0	50	-10	-50	50	30	0	50	10
97	5	4	2	2	3	31	0	5	5	1	10	2	10	-31	20	0	0	0	40	9	0	0	40	41	-1	-1	40	-42	-42	41	10	10	41	-42	-42	40	9	9	41	20
98	4	2	2	2	3	76	0	100	51	1	50	2		-20	-18	-23	12	25	13	9	33	32	-24	50	34	23	-50	-50	-50	50	20	31	12	5	-50	50	29	50	50	21
99	3	3	1	1	1	49	29	19	70	1	50	2	0	41	-20	-11	40	10	50	-30	-21	-20	10	30	30	41	-11	-10	-50	30	21	29	-9	-9	-11	-9	-10	-9	-20	-19
100	4	3	2	2	4	5	0	10	90	1	40	2	0	-50	10	-40	-10	10	41	41	50	-31	50	40	0	50	0	0	0	50	30	0	0	0	0	50	10	0	40	40
101	4	4	1	1	2	94	50	19	29	1	41	2	10	30	31	-20	30	50	-30	-22	-10	-31	-31	10	-19	40	-10	8	29	-20	10	35	11	22	50	11	21	42	22	32
102	3	2	2	2	4	79	14	70	29	1	30	2	10	-50	-50	20	17	50	50	-31	50	-21	-21	50	46	20	10	50	-5	50	50	50	50	50	-11	50	50	50	50	50
103	3	3	2	2	4	86	50	49	49	1	50	2		-50	-26	0	30	40	16	0	24	-1	0	31	32	32	0	-1	0	50	50	50	0	0	0	0	0	0	27	26
104	2	2	2	2	2	40	2	19	4	1	31	2		-4	-7	-6	15	-6	50	31	27	20	12	-7	5	5	-50	-50	-50	4	5	6	-50	-50	-50	7	8	5	-7	-7
105	5	3	2	2	3	23	1	36	83	1	29	2		-2	-11	10	50	-13	20	-5	20	2	-2	4	30	4	10	3	-11	31	30	19	5	21	-9	50	50	20	30	50

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
-10	30	31	-20	30	30	-20	50	50	50	30	31	-50	31	31	16	20	20	20	-41	10	40	-35	-35	-36	-40	20	19	10	20	10	-21	-20	0	0	0	0	-20	21	20
7	5	6	9	6	7	7	8	5	7	7	6	8	10	4	10	2	4	5	7	6	5	-5	5	-5	-4	4	5	-5	3	4	-4	7	-4	3	4	5	3	3	5
-10	19	42	-7	13	32	6	9	32	12	31	35	-20	30	31	20	31	34	19	21	28	13	-12	-10	9	12	7	9	-8	9	10	11	-7	2	6	15	5	8	17	-6
19	41	30	0	40	10	10	39	32	0	41	15	0	17	23	0	20	25	25	10	10	32	25	26	8	26	11	0	19	0	16	22	22	7	7	0	18	24	25	0
20	31	21	21	31	0	21	11	21	22	31	-10	0	20	20	31	10	22	31	11	20	10	-9	-10	-11	31	31	10	10	30	31	11	0	0	0	21	20	11	10	10
-33	50	50	50	0	50	-8	38	50	19	50	40	-50	50	26	10	7	50	50	49	31	8	-50	-50	-9	-50	50	-50	50	10	-11	-11	-11	-50	-37	50	-50	-50	50	29
-50	50	50	30	50	-50	-50	50	10	10	50	-50	-50	50	50	50	-50	-50	50	50	50	50	-50	50	-50	-50	-50	-50	50	50	-50	-50	-50	-50	-50	-50	50	50	-50	-50
10	10	50	-10	20	-10	-50	50	50	10	40	31	-31	40	-20	50	30	-10	50	10	-10	50	-11	-21	20	-21	40	10	41	41	-11	20	30	-50	10	10	-10	-22	50	30
-50	50	-50	-50	50	-50	-50	50	-50	-50	-50	-50	-50	50	0	50	38	0	50	35	-50	-50	-50	0	0	50	0	-50	0	-50	0	0	0	0	0	-20	0	31	0	6
50	50	50	50	50	-50	0	50	50	20	50	0	-50	-15	50	50	-50	0	50	-50	50	0	50	-40	-40	-50	-50	0	0	50	-50	0	0	-10	0	-50	-20	0	10	-50
0	0	0	0	0	9	10	-21	0	0	-50	-21	-20	0	8	10	-20	0	10	-20	0	10	-11	0	10	19	20	20	20	0	0	9	-10	-11	-11	-21	10	10	10	-21
10	20	25	10	20	25	10	50	45	40	20	30	10	10	40	30	10	30	45	-50	20	30	-25	-20	10	40	50	-25	-25	20	30	0	0	0	10	-25	25	50	50	10
50	45	30	50	40	30	40	45	30	50	45	35	50	41	31	50	10	20	50	9	20	41	-10	-20	-50	50	50	10	41	41	40	50	50	20	50	30	50	50	50	30
-14	50	11	-42	50	28	-37	50	39	-35	50	12	-41	50	38	-3	6	3	40	49	32	13	-22	-9	2	5	30	-3	17	42	23	-46	-41	-38	-40	-14	-19	21	50	-11
15	50	35	0	50	35	-15	10	50	20	50	35	-10	20	10	35	15	5	45	0	0	40	0	30	15	-10	20	-20	30	-35	-20	10	15	0	0	-5	-10	-5	50	-10
50	50	50	30	50	0	0	50	50	0	50	-50	-50	40	29	50	0	0	50	0	0	0	0	0	0	50	50	-50	20	0	0	-31	0	-50	-10	-50	0	50	50	-31
30	46	41	36	46	15	10	41	41	41	46	30	5	41	30	30	20	25	25	-10	20	15	-10	-21	-15	0	5	0	5	-11	-11	20	0	-20	-20	0	0	36	36	5
20	31	20	20	31	10	21	31	10	20	41	10	20	20	10	11	21	10	20	11	11	20	20	31	31	20	41	10	-10	30	20	41	21	30	20	10	10	31	20	10
-18	-3	-14	-25	-2	-16	-23	-3	-10	-21	-4	-31	-40	3	6	16	3	18	25	3	10	36	-4	-4	-10	16	14	8	14	11	17	-13	-11	-9	-13	2	2	4	5	12
44	45	35	5	45	6	2	45	45	45	45	25	5	25	6	25	25	25	45	25	25	25	2	25	25	48	25	25	45	48	45	28	27	48	48	42	18	25	42	25
0	13	36	26	9	46	16	14	45	46	14	34	26	-20	25	36	-41	-42	20	-10	20	30	10	21	8	10	20	-10	20	9	0	31	30	0	14	-21	0	30	0	31
-50	34	38	-50	31	32	-45	41	32	-50	41	-26	-50	20	46	50	24	16	50	11	11	50	29	-10	-39	-23	8	-15	-15	23	22	20	39	-30	-25	-11	-34	22	38	-18
18	50	-24	-44	24	29	-7	34	12	2	50	-50	-50	50	21	-22	50	21	0	41	16	0	-37	-33	50	10	9	-37	20	14	-20	-50	-15	-50	-29	-41	-19	-30	-17	-12
8	16	6	5	0	0	3	3	5	5	5	0	0	1	0	2	3	3	5	2	5	35	3	3	3	50	-22	-14	20	-8	-10	8	-14	8	-8	3	0	-3	3	-3
39	40	40	41	0	0	0	39	40	41	50	0	0	0	0	0	0	0	49	0	-2	-4	0	0	0	20	20	11	11	-4	-4	29	24	29	24	29	29	0	0	0
-50	50	50	-50	50	21	-50	50	30	-20	50	0	0	0	0	0	-10	20	10	0	0	50	0	0	50	0	0	-11	-10	9	-50	-20	-50	-50	-50	-20	-21	-50	-50	-50
20	40	-32	-32	30	-31	-30	40	10	10	41	-41	-42	-31	-32	20	-31	-32	41	-11	-10	10	-21	0	0	0	0	-11	-11	20	10	-1	-1	-1	0	0	0	10	10	20
50	50	23	10	0	1	0	50	2	24	50	-2	0	19	0	50	50	0	50	0	0	50	0	0	0	50	50	12	20	50	50	50	50	20	23	10	12	49	46	50
-20	37	23	24	14	10	10	11	12	29	14	19	19	13	12	13	32	30	33	-15	-17	-16	-11	-7	-12	30	31	30	10	31	10	21	21	-11	-10	10	10	8	9	20
40	41	20	31	21	20	40	50	30	0	50	-20	-21	0	0	0	10	20	40	10	20	45	11	10	0	40	40	-10	-10	40	10	45	45	21	20	5	5	31	31	42
50	32	41	50	-21	-21	50	19	-11	49	-11	-21	50	-11	-10	49	-10	9	-11	-10	-11	50	-20	-17	-20	50	50	50	50	50	50	50	40	12	41	30	42	50	50	50
40	50	50	50	50	-31	-31	50	50	50	50	20	-50	50	50	50	-21	-50	50	20	-21	50	-50	-50	30	50	50	10	30	50	-21	-4	-10	-11	9	-11	19	20	41	50
27	50	50	50	50	23	50	50	50	50	50	0	50	50	17	50	40	15	50	24	6	50	50	50	50	31	50	0	33	50	37	-20	50	0	17	20	40	16	42	26
-6	-7	-6	-7	4	4	5	6	7	8	7	-50	-50	5	7	6	5	5	5	7	12	14	7	7	7	17	15	16	16	14	16	14	14	15	14	15	16	16	15	16
10	50	50	0	50	31	10	35	50	18	50	12	-7	41	22	35	30	20	40	7	30	45	-10	-31	22	3	47	-13	2	-5	-5	-5	-10	-11	-12	30	30	-3	28	-10

81	82	83	84	85	86	87
0	20	21	21	20	21	21
3	5	4	11	4	7	7
6	22	16	8	10	17	29
0	33	32	18	15	16	42
0	20	0	40	42	20	0
50	50	0	-50	-50	-50	31
-50	49	50	50	50	50	50
9	50	50	20	20	50	50
0	26	0	50	0	0	0
-50	50	50	0	0	10	50
-10	20	20	21	19	20	18
25	50	50	25	25	25	25
30	41	41	50	50	20	50
-12	50	50	39	38	38	39
-5	50	50	31	20	45	30
50	50	50	0	0	50	0
5	46	46	46	46	46	46
10	20	10	40	40	50	41
9	5	7	7	9	7	12
45	25	27	25	28	24	28
0	10	0	0	0	0	0
-23	12	9	-40	-27	50	50
38	32	-17	50	12	36	18
3	4	-2	2	4	-2	7
0	0	0	1	-1	0	0
-48	-50	-48	-50	-50	-50	-48
20	20	20	30	30	31	30
50	50	50	30	21	20	19
-11	-10	-11	13	-8	8	18
42	50	50	45	45	20	50
50	50	50	50	50	50	50
50	50	50	50	50	50	50
0	33	35	25	25	50	50
15	15	17	14	14	15	15
2	50	50	30	31	-14	20

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
106	3	3	2	2	3	22	8	39	0	1	50	2	10	-21	-50	50	50	20	50	50	50	10	19	50	50	50	21	10	21	50	50	50	21	20	20	50	50	50	50	50	
107	4	3	2	2	4	99	19	98	91	1	30	2	0	30	10	11	20	41	40	10	10	-11	20	42	-11	21	-20	32	50	10	31	30	50	30	30	50	10	10	-31	21	
108	4	4	1	1	4	200	69	29	40	1	41	2		-50	20	-30	10	21	-41	21	30	-21	41	-40	20	48	50	21	-50	50	50	50	50	-50	-50	50	50	50	50	50	
109	4	4	1	1	4	20	4	81	9	1	41	2	0	25	-31	-16	14	0	-14	-10	-21	-17	-10	29	28	15	24	17	0	36	21	20	33	27	0	33	34	24	24	33	
110	3	3	2	2	2	200	27	80	61	1	32	2	0	-48	-33	-50	50	-50	50	22	29	-50	50	50	10	11	-50	-50	-50	50	50	50	-50	-50	-50	50	50	50	20	11	
111	3	3	2	2	2	14	30	5	22	1	16	2	21	-20	-20	-4	20	20	10	6	5	-10	20	-11	-6	15	-50	-50	-50	20	20	10	-30	-31	-31	20	20	10	-30	-30	
112	4	4	2	2	4	9	19	9	19	1	-42	1	10	10	30	20	20	10	21	11	20	9	0	10	-2	-9	0	0	0	8	4	3	5	-6	6	0	13	16	0	0	
113	5	3	1	1	4	120	20	80	9	1	31	2		-7	-40	-20	41	-2	10	4	-10	-10	-3	10	10	30	5	7	14	7	8	27	-9	-10	-12	6	41	23	37	10	
114	4	7	1	1	3	15	39	30	100	1	31	2		31	36	25	50	31	10	5	16	-4	-4	50	50	50	50	50	10	50	50	50	50	50	-10	50	50	50	50	50	
115	4	4	2	2	4	49	1	70	29	1	41	2		50	41	-30	41	50	10	-2	10	10	-1	50	30	40	41	50	-10	50	50	-10	50	50	-11	50	50	-11	50	50	
116	3	3	1	2	1	24	75	25	0	1	-11	2		10	20	-20	30	50	30	0	0	-50	50	50	10	25	35	10	-10	35	20	30	20	10	-10	35	30	30	20	30	
117	4	4	2	2	3	156	25	25	50	1	2	2		10	10	2	20	10	41	-11	10	-40	1	-11	-10	10	10	-10	-11	10	-11	-10	10	-10	-12	10	-11	-10	11	-12	
118	4	3	2	2	3	99	95	5	100	1		2		10	-50	10	50	10	10	1	1	1	1	20	50	20	50	10	-50	50	50	50	50	-50	-50	50	50	25	25	50	
119	2	2	2	2	2	13	1	100	5	1	21	2	-50	9	-50	8	50	-10	-49	0	0	-33	-1	0	0	0	-47	-49	-48	-49	-49	-46	-47	-49	-49	-47	-49	-50	-46	-48	
120	4	3	1	1	4	37	0	50	50	1	30	2		0	0	-31	0	41	20	0	25	0	0	31	0	0	0	0	-50	0	0	-30	25	25	-50	40	41	0	30	31	
121	4	4	2	2	3	139	0	49	50	1	50	2	-41	20	-1	41	0	50	10	-21	20	-21	-31	-10	40	50	49	-10	-40	50	50	50	49	-9	-40	50	50	50	50	41	
122	3	2	2	2	6	26	0	6	15	1	49	2	0	-33	10	0	0	5	7	-8	15	-49	-10	22	10	25	0	50	0	35	50	0	-17	50	-17	50	50	50	50	49	
123	4	3	1	2	4	14	19	9	5	1	41	2	5	0	41	20	41	25	41	20	41	41	-25	0	41	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
124	3	3	2	2	1	200	29	29	39	1	20	2	-50	-50	-50	0	19	10	9	1	20	-20	-21	30	9	10	30	30	-50	41	41	-41	38	20	-50	41	41	-40	40	40	
125	2	2	1	1	4	200	46	71	88	1	41	2	-3	-24	-24	-48	-41	30	50	30	10	-21	50	40	10	23	-28	-45	-28	-50	45	-50	-50	-50	-50	-41	-50	-50	21	38	
126	7	8	3	3	3	200	0	0	100	1	0	2	0	-50	-50	-50	-50	50	50	-50	-50	-50	50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	
127	5	4	1	2	4	160	71	10	30	1	50	2	0	-30	10	-30	40	30	-50	0	-20	25	50	0	25	50	-30	0	-30	20	-30	-50	-50	10	-30	-50	-50	-50	-30	50	
128	4	3	1	1	3	5	10	19	9	1	10	2		-31	20	-10	40	50	50	20	30	10	-10	20	10	20	-41	-41	-41	20	10	20	-41	-40	-42	20	10	20	30	10	
129	1	1	1	1	0	25	0	3	1	2	10	2	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	-1	0	0	0	
130	3	3	1	1	2	34	29	71	70	1	20	2	0	50	-50	10	31	-50	31	50	50	50	10	20	50	10	50	-41	-50	50	50	50	50	-50	-50	50	50	50	40	50	
131	4	4	1	1	4	26	4	1	6	1	20	2	12	-10	31	-10	5	49	8	7	11	8	8	6	6	10	5	5	6	3	7	7	17	7	4	14	2	10	10	21	
132	5	4	1	1	4	50	0	50	20	1	50	1	-50	0	20	20	50	50	30	20	30	30	10	20	30	40	0	0	0	0	0	0	30	30	30	50	50	50	40	40	
133	4	4	1	1	4	126	0	24	75	1	10	2	0	-50	25	-26	35	25	15	-25	35	-26	-50	-25	24	25	25	25	-25	25	25	25	25	25	25	-50	25	25	25	15	25
134	6	3	2	2	2	0	0	0	0	1	-11	2	-12	9	0	0	0	10	40	10	30	0	30	30	39	49	0	0	-32	21	10	10	41	0	-31	50	30	10	0	40	
135	6	8	2	2	4	16	0	28	19	1	50	2	0	0	10	10	18	0	9	9	20	50	-1	10	10	10	0	0	0	0	0	0	9	0	-11	9	9	10	10	10	
136	4	3	1	1	3	4	1	2	1	1	5	2		-10	10	-10	5	5	15	15	10	16	10	31	41	21	41	20	-10	50	50	21	50	10	-10	50	41	30	10	31	
137	5	3	1	1	4	36	7	11	51	1	23	2		-26	9	-15	-2	32	15	5	34	-19	-14	-35	33	10	-16	44	7	38	30	11	-11	31	15	30	31	6	-13	40	
138	6	3	2	2	4	200	0	10	90	1	50	2		-42	-40	-50	50	20	0	-10	-10	-50	40	50	41	40	-10	50	50	50	50	50	50	50	50	50	50	50	50	50	50
139	7	3	2	2	4	121	0	81	19	1	31	2	0	0	0	0	20	31	20	0	20	0	-20	-11	50	20	40	-50	-50	21	50	0	0	-50	-50	50	50	-20	10	30	
140	6	5	1	1	3	31	50	50	5	1	10	2	0	0	0	0	30	50	0	0	0	0	0	20	20	20	0	20	0	0	20	10	0	20	0	0	20	0	0	20	

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
50	50	50	50	41	39	41	40	30	41	40	40	50	50	50	40	20	20	50	-50	-50	-50	-50	-50	50	50	-50	-50	50	50	50	50	50	50	50	50	50	50	50	50	
40	40	10	30	31	9	31	50	20	19	-11	31	30	10	19	50	-11	-10	50	-10	-10	50	10	10	-10	50	50	10	50	50	50	10	50	50	50	10	50	50	50	32	
50	50	50	50	20	50	50	48	50	50	50	4	7	-50	50	49	-48	48	49	-50	50	50	50	-50	-10	50	50	20	-50	50	50	50	50	50	50	50	50	50	50	50	
20	31	31	10	38	16	10	35	35	35	34	15	15	26	26	18	25	32	32	24	24	32	0	0	0	0	30	9	24	0	15	30	30	0	-1	14	26	15	28	0	
30	22	18	22	-50	14	26	-50	9	35	50	-50	-50	22	22	29	50	50	50	-50	-50	50	17	20	39	-50	-49	-50	-50	31	31	44	41	39	40	50	50	50	50	-24	
-30	-30	-30	-29	-30	-30	-30	20	20	10	-50	-50	-50	-9	-9	10	-10	10	10	-5	-4	6	-19	-19	-9	6	-5	17	-6	6	-4	-3	-9	-30	-30	-40	-40	26	25	10	
10	-1	0	0	2	4	41	12	5	15	13	9	10	10	0	0	8	7	5	9	10	0	7	0	0	8	22	3	-1	-2	0	-6	3	11	12	19	10	10	13	0	
26	26	30	40	30	38	32	14	19	26	13	16	31	11	21	24	-10	20	18	10	18	24	20	35	20	33	43	6	39	21	37	41	-11	20	17	50	50	-16	-39	36	
10	50	28	12	15	31	20	50	50	16	17	50	-6	50	37	9	50	24	39	50	21	12	-50	7	11	-10	20	-20	-11	10	-8	-25	-22	-31	5	-20	9	-21	11	-20	
-40	50	50	-50	50	50	-50	50	50	-11	50	-20	-50	50	50	-12	50	30	10	-11	-10	10	-50	-50	-50	-50	41	-50	41	-40	-40	-50	-50	-50	-50	-50	-41	30	40	-41	
40	40	20	30	50	-20	30	30	30	30	30	-10	0	20	20	50	30	20	50	10	25	50	-20	10	10	30	30	-20	-20	30	30	0	30	-10	20	0	10	20	10	-20	
-13	10	-13	-12	10	-10	-10	4	-10	-10	7	-8	-8	9	-3	7	20	11	29	-5	-7	-7	-5	-5	-9	5	-25	-16	-5	5	1	-5	-5	-5	-5	1	35	-1	-4	-5	
10	50	50	10	50	50	10	50	50	50	50	-50	-50	50	50	25	25	25	50	25	50	50	-41	-50	41	25	50	-10	25	50	10	50	41	10	-10	-10	-10	50	30	50	
-48	-47	-46	-45	-47	-49	-48	-45	-46	-45	-49	-49	-49	-2	6	3	0	-2	-4	-44	-46	11	1	-3	-1	22	-25	13	-6	27	-14	3	0	30	-29	0	0	0	0	0	
0	50	40	0	18	41	0	50	50	0	50	0	0	0	0	-1	50	20	20	0	0	20	0	0	0	-50	-50	-50	0	0	0	-50	0	-50	0	-50	0	20	0	0	
41	50	50	50	50	50	50	49	50	50	50	-31	-50	50	41	33	50	50	50	-50	-50	-50	-50	-39	31	-41	-8	50	-50	40	21	49	0	-50	0	-44	-14	40	-1	50	
49	50	50	49	15	16	50	50	50	50	0	50	0	0	16	50	3	50	49	0	6	50	50	0	0	10	10	19	0	47	0	50	0	1	-4	13	7	50	49	12	
1	0	0	0	0	0	0	0	0	-1	0	0	3	0	40	40	0	0	-1	0	0	0	0	0	0	9	10	20	20	23	23	23	16	23	20	18	27	24	18	21	
-48	30	27	-11	30	-30	30	30	30	-49	40	30	-50	10	30	31	0	11	41	-11	10	41	31	20	-32	41	41	-31	-31	32	9	29	30	10	-20	20	31	41	41	31	
-17	50	-30	-50	50	12	-24	50	23	-17	50	-50	-50	50	-50	-50	14	-13	26	50	-14	50	9	22	15	-31	-31	-31	-35	12	-14	41	24	35	34	21	18	18	16	-7	
-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	50	50	50	-50	-50	-50	-50	-50	-50	-50	50	50	0	0	-50	-50	-50	-50	
30	0	50	30	10	30	30	0	50	50	30	10	30	0	30	50	-50	10	50	-30	20	50	50	-50	-30	50	50	50	50	50	30	30	30	-20	0	-20	-20	20	40	50	
30	20	10	20	40	10	20	20	10	40	17	-39	-43	30	12	30	19	-10	50	19	10	30	20	9	30	21	-10	50	20	20	-10	41	40	20	21	10	10	30	20	-10	
0	0	0	0	1	0	-1	0	0	0	0	0	0	0	1	0	15	15	10	4	0	-2	2	-6	2	2	0	0	-1	0	0	0	0	1	3	2	-5	-7	29	9	
10	30	50	-20	10	50	-31	50	50	50	50	30	-40	50	50	50	-50	-50	-50	41	50	50	20	50	-11	10	50	-40	31	-41	0	0	0	-50	-50	-10	0	20	50	31	
2	9	19	5	26	9	2	16	7	6	33	14	4	10	14	16	18	7	8	11	3	1	-4	1	8	2	1	12	-3	39	20	9	9	12	8	9	8	36	6	7	
40	40	40	40	40	40	40	40	40	40	30	30	30	40	40	40	30	30	30	30	30	30	0	0	0	40	20	10	10	10	10	20	20	20	20	20	20	20	20	20	20
5	25	25	5	5	25	25	25	25	15	25	15	-25	5	25	35	15	-25	35	-50	15	35	-25	-25	35	-50	-50	-50	25	25	-25	50	35	50	40	50	15	35	35	15	
-10	50	19	0	21	31	0	50	50	41	50	-21	-50	11	20	11	20	10	30	9	30	50	10	0	9	40	40	10	20	40	40	0	40	-21	30	0	0	40	10	30	
9	11	9	9	0	0	0	0	0	0	18	19	20	9	10	10	8	21	29	20	19	19	11	10	10	20	19	19	8	29	49	11	50	28	30	30	41	20	41	41	
-20	31	21	-10	10	-10	-50	9	50	9	50	9	-10	41	41	10	20	31	41	10	-20	-20	-30	-41	30	5	20	6	6	-10	-20	-2	-10	-10	-20	-20	-20	15	20	-4	
11	-11	43	16	-15	43	4	34	28	-32	-10	46	-8	-12	39	26	-21	14	50	-13	17	47	-11	-43	13	29	45	22	34	33	-23	12	11	-10	-6	-10	-11	43	46	38	
50	50	50	50	-10	50	50	50	50	50	50	50	50	20	50	50	-50	-50	-50	-30	50	50	10	40	40	30	30	-30	-30	50	0	0	25	0	50	10	0	25	50	0	
41	20	50	50	0	50	31	0	50	10	0	-50	-50	50	50	50	50	50	50	20	-10	41	0	-30	-41	20	31	-21	0	31	21	0	0	0	0	11	0	50	0	0	
20	0	20	20	0	20	20	0	20	20	0	20	0	0	20	10	-20	-20	-20	0	0	0	-30	-30	-20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

81	82	83	84	85	86	87
50	50	50	50	50	50	50
50	50	50	50	50	50	50
-50	-50	-50	-50	-50	50	50
0	31	31	20	20	24	34
-30	-31	50	50	50	50	50
-5	-10	-10	16	15	16	15
8	9	4	19	9	5	5
33	-3	2	3	6	-5	6
-8	21	20	20	20	50	50
10	10	11	10	10	-10	-10
-20	30	40	50	50	50	50
10	45	-15	15	-5	31	-21
50	50	50	50	50	50	50
-2	0	0	0	-1	0	0
0	0	10	20	0	-50	0
0	50	50	31	0	40	0
14	50	-50	33	-47	50	34
23	40	17	41	41	40	41
32	50	50	50	50	50	50
-15	50	50	50	50	50	50
-50	-50	-50	-50	50	50	0
0	50	50	50	0	50	50
-11	30	31	10	12	40	21
-18	-42	25	-11	17	-21	-15
31	41	-10	41	41	50	41
6	6	8	4	6	6	8
20	20	20	20	20	20	20
15	50	50	-25	-25	50	50
0	50	50	10	10	0	11
20	49	29	50	30	31	30
7	5	6	-9	-9	-19	-19
39	4	4	-6	-8	48	11
0	50	50	0	0	50	50
0	50	41	20	20	21	20
0	0	0	0	0	0	0

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
141	2	2	2	2	3	50	18	54	19	1	3	2		-8	-49	-15	5	10	30	15	44	-12	19	35	26	14	50	13	-39	50	50	6	50	40	-21	50	36	-1	50	50		
142	5	4	1	1	4	23	1	91	9	1	10	2	-1	-11	-50	-50	-50	41	30	-50	-50	-50	50	50	-50	-50	50	30	-20	50	41	-20	50	50	-50	50	41	-11	50	50		
143	2	2	2	2	2	50	0	100	100	1	19	2	-50	50	50	0	50	27	50	50	50	-25	-1	18	15	41	50	-49	-43	50	49	49	50	-46	-47	45	37	-22	23	50		
144	5	4	1	1	3	8	0	4	0	1	21	2	0	0	0	0	20	0	0	-11	-1	0	0	0	9	0	0	0	0	9	10	10	-11	-11	-11	10	9	9	0	9		
145	4	3	1	1	2	10	0	2	4	1		2	2	-1	2	3	4	2	1	2	-1	4	3	1	1	1	2	2	3	2	1	2	3	4	7	1	1	3	2	2		
146	2	2	2	2	3	10	1	4	3	1	30	2		-50	-21	-50	10	20	5	-30	30	-41	-3	-33	12	34	-19	34	-46	-10	43	-50	30	41	-50	50	50	-50	31	40		
147	4	3	1	1	3	50	19	50	81	1	30	2	10	0	10	50	10	-10	0	0	0	-31	-21	10	41	50	50	41	31	50	50	50	41	31	31	50	50	45	41	50		
148	3	3	2	2	4	76	4	29	67	1	31	2	-13	-12	31	9	13	46	19	49	50	15	16	25	43	12	18	46	-43	41	45	-19	34	48	-16	30	49	-13	43	50		
149	4	4	2	2	4	47	0	70	50	1	50	2		10	0	31	31	40	50	-10	-10	-20	-30	-10	50	50	10	-10	-10	10	-10	-10	10	-9	-9	11	-9	-10	10	-9		
150	4	3	2	2	5	125	10	30	50	1	43	2		-10	10	-50	20	31	9	25	50	10	40	10	15	20	50	50	-20	21	20	21	21	-10	-50	50	50	50	20	20		
151	3	3	1	1	4	42	12	39	2	1	36	2		26	-6	-34	45	-12	45	-12	27	-12	22	20	40	15	50	-22	-25	50	50	-11	50	-10	-50	50	40	-10	20	50		
152	4	3	2	2	4	87	3	61	30	1	16	2	-15	-10	11	12	11	34	11	13	46	-13	8	16	34	22	20	42	8	29	44	-8	34	50	-14	34	49	-12	44	48		
153	5	3	1	1	4	23	0	20	0	1	0	2	0	0	0	-10	0	-10	10	-20	20	10	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
154	5	4	2	2	4	113	40	40	20	1	50	2		30	20	30	50	30	19	29	40	31	30	20	30	50	30	30	40	30	30	40	30	30	40	30	30	40	30	40	30	40
155	3	3	1	1	3	60	0	70	29	1	30	2	0	20	-30	20	20	40	40	10	30	-50	-30	30	50	10	10	50	0	10	50	0	30	30	0	30	30	0	20	50		
156	2	2	1	1	4	100	9	70	100	1		2		-11	-31	10	50	50	50	50	50	50	10	-31	31	50	-50	-50	-50	-10	-21	-31	-30	-21	-31	-10	-11	-12	-11	-10		
157	3	3	1	2	3	25	0	93	81	1	16	2	0	-25	-19	-23	-24	15	24	-15	17	25	-19	-4	47	15	40	50	-18	-28	41	11	43	15	-21	10	20	8	-17	45		
158	7	7	1	1	4	30	4	86	11	1	47	2	-14	-11	-14	45	8	49	11	41	33	44	48	46	19	35	39	35	-50	50	30	-21	46	24	-16	44	25	-22	47	35		
159	5	5	1	1	2	10	9	9	10	1	20	2	29	-50	-50	-15	-10	20	35	-5	-5	5	-20	-20	10	10	-40	10	10	-41	10	9	-41	10	-41	41	41	-41	19	21		
160	3	4	1	1	4	155	29	1	50	1	50	1	50	50	50	50	50	25	35	32	50	19	50	50	50	50	50	50	50	-50	50	50	-50	50	50	-50	50	50	-50	50	50	
161	2	2	2	2	2	66	0	100	2	1	12	2		20	-10	20	8	20	40	20	50	31	-9	4	14	28	-7	-10	17	-13	-31	10	-26	-33	-48	-11	-23	-23	10	22		
162	5	4	2	2	3	75	18	28	39	1	20	1	29	29	19	28	39	30	30	39	38	30	38	30	30	40	30	30	40	30	40	30	30	40	30	30	30	40	20	40		
163	3	3	2	2	4	19	1	50	51	1	30	2		-50	-50	27	10	-1	10	10	25	10	-10	30	31	31	20	20	-11	50	50	-10	50	50	-10	50	50	-10	50	50		
164	3	8	1	1	4	66	0	70	30	1	50	2	0	-50	-50	-50	20	-25	20	-50	-50	0	50	-30	20	30	30	40	10	50	30	30	40	40	20	50	50	50	30	30		
165	7	2	2	2	4	100	0	50	73	1	50	2	0	10	0	0	21	20	41	50	50	50	11	10	10	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
166	4	4	1	1	4	186	2	100	49	1	50	2	-50	10	-20	31	30	50	16	32	20	19	-50	19	25	33	20	19	9	30	31	28	32	32	27	35	35	32	17	36		
167	6	3	2	2	3	60	0	19	80	1	50	2		30	30	30	30	31	30	10	10	50	-50	0	50	50	9	50	50	50	50	50	50	20	50	50	50	50	50	50	50	
168	4	4	2	2	2	124	49	39	61	1	12	2	0	0	0	25	50	9	0	10	18	23	-29	-1	-1	3	18	17	-30	16	21	-12	9	7	-50	17	17	-50	12	16		
169	3	3	1	1	4	60	20	70	40	1	20	2		-50	-50	-40	10	20	40	-40	40	-10	30	50	40	10	50	10	-50	30	50	-50	50	10	-50	50	40	-50	20	40		
170	3	4	1	1	3	61	51	35	62	1	-18	2	-16	15	18	-25	-20	-21	22	-24	-22	31	30	17	23	50	27	29	46	45	22	47	-17	19	42	-40	33	47	-41	35		
171	3	3	2	2	4	50	70	40	50	1	50	2	0	50	50	0	0	0	0	-50	-50	-50	0	-30	21	50	-30	0	0	-50	-50	-50	-40	20	20	-50	-50	-50	-30	21		
172	3	3	1	1	3	8	1	74	35	1	30	2		-26	13	34	38	43	10	-21	43	-30	-9	-34	41	31	30	14	-19	30	40	-13	24	12	-17	24	28	-14	-17	41		
173	2	2	2	2	4	200	50	29	90	1	50	2	0	0	50	50	50	37	50	19	16	-14	-50	50	50	50	-22	50	50	-19	50	50	-11	49	49	49	47	48	45	45		
174	3	3	1	1	0	3	1	1	1	2	-50	2	-50	0	0	-1	0	1	50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-46	-50	-50	-44	-31		
175	6	2	1	2	4	23	0	91	10	1	0	2	0	0	0	30	0	0	20	10	1	10	-11	30	20	0	30	30	-50	32	49	9	50	10	-50	50	50	50	41	40		

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
-12	50	50	-14	41	40	-10	50	42	-17	48	23	-16	50	24	-18	29	32	-11	-14	39	26	-1	25	-16	-12	-19	30	-17	16	23	21	39	13	32	14	-20	21	42	47
11	50	50	-11	50	30	-10	50	50	10	50	50	-50	50	40	11	50	40	9	30	20	10	-50	-40	11	-41	10	-50	10	-41	-11	-50	-50	-50	-50	-40	10	10	-11	
-49	50	49	-46	24	24	24	49	45	35	48	-46	-45	47	46	47	-10	-11	48	43	43	43	-12	28	44	45	47	-21	-21	46	20	12	0	0	0	39	17	49	50	0
0	0	0	1	0	0	0	9	10	9	0	-10	-11	0	9	10	0	0	-1	0	0	0	0	0	0	10	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	-2	-2	0	1	0	0	-1	0	3	3	-5	2	2	1	2	1	3	2	3	2	3	1	3	2	2	2	3	2	2	2	3	3
-50	35	34	-50	10	50	-50	50	50	-50	47	27	-50	50	35	-50	50	20	46	45	34	50	19	36	-42	1	7	-41	-46	3	-46	-39	-45	-41	-41	-45	-46	18	41	16
31	31	50	22	50	50	31	50	50	50	50	30	8	41	50	30	20	10	30	0	0	0	-31	-21	-11	5	10	0	10	41	-10	-50	-20	-31	-41	-31	-31	10	41	0
-16	38	49	-17	49	40	-16	41	48	-19	49	41	-26	23	42	15	14	23	35	-18	11	31	-16	-9	16	16	-20	-15	19	41	32	43	42	30	32	7	12	40	43	47
-10	10	-9	-9	10	-10	-10	11	-9	-10	11	-10	-9	11	-10	-10	-10	50	50	11	-10	-10	-10	31	21	50	31	31	20	21	20	21	31	21	30	31	21	31	31	31
20	21	21	21	5	31	31	50	50	50	50	16	-28	36	37	38	9	25	42	-6	20	30	-13	-12	-12	-20	-18	-13	-10	31	34	50	39	23	37	-20	-19	39	24	41
10	50	40	-21	50	20	10	10	50	50	50	10	-50	10	25	33	-24	16	50	-21	-10	11	-18	-10	-2	20	20	-30	50	50	50	50	50	-20	-20	-10	-10	50	50	10
20	39	49	37	50	35	9	47	50	24	50	50	7	19	27	38	27	35	47	8	21	43	-15	-38	-12	-17	18	-36	14	48	45	44	47	43	43	11	-16	45	45	35
0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	20	20	0	0	50	50	0	0	0	0	0	0	20	20	0
30	30	40	30	30	41	30	20	40	40	40	40	20	30	30	40	20	30	50	19	30	50	50	40	10	30	20	30	30	40	40	29	30	49	48	40	30	41	50	20
10	10	50	10	41	50	10	10	50	20	30	50	10	40	10	30	50	10	30	0	50	30	30	20	50	-10	30	-11	30	30	-10	-30	-30	-31	-31	10	10	10	30	-21
-11	-21	-22	-20	-11	-23	-50	-12	-11	-10	-21	-20	-31	-21	-21	-31	11	10	50	-12	-20	50	-10	-22	-35	50	50	20	-11	10	-22	24	-20	-10	-17	26	-16	-12	13	50
9	14	43	-9	-9	50	16	30	49	12	47	26	-13	16	44	8	22	14	33	-34	40	21	-15	-31	10	8	14	-15	10	28	-9	14	-2	-23	0	-6	-4	26	20	25
34	46	46	41	49	32	23	46	42	23	49	46	-16	50	17	28	49	13	39	14	24	38	-32	-25	-16	-50	-24	24	-26	31	44	49	48	34	45	-16	-24	43	41	47
-26	32	26	-33	12	7	-42	31	17	-27	41	-41	-41	34	36	34	-41	-20	28	-12	-5	-35	-33	-19	41	-22	-17	-21	-15	-40	-40	-28	-33	-41	-34	-42	-41	-15	-16	-34
50	-50	50	50	-50	50	50	-50	50	50	-50	50	50	-50	50	50	-50	50	50	-50	50	50	-50	50	50	-50	50	-50	-50	-50	-50	-50	50	-50	50	-50	50	-50	50	-50
31	10	22	31	2	1	1	2	3	-6	-5	-16	-2	10	17	36	-5	-19	-30	-5	-7	-26	-2	-2	-3	41	31	11	10	30	41	41	31	41	40	-10	-10	-6	-4	41
40	20	40	40	30	30	40	30	40	30	20	40	40	30	30	40	10	40	50	50	30	20	50	31	20	20	30	29	30	29	31	31	40	30	39	30	30	40	40	30
9	50	50	10	50	50	-11	50	50	-11	50	50	-10	50	50	-10	41	30	-6	20	21	10	-10	-10	-10	-2	-1	-11	-2	-3	-3	-10	-10	-10	-11	-20	-20	-10	-10	-31
30	50	50	50	30	30	30	50	50	30	50	20	10	20	20	20	10	35	50	0	20	50	40	10	15	0	30	-50	20	30	0	10	0	0	0	0	0	0	30	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	50	0	0	31	30	0	0	0	0	30	31	50	50	42
20	23	29	19	20	25	22	21	22	22	18	20	17	24	36	39	24	26	27	23	24	27	34	20	20	14	23	29	23	23	14	-7	-8	15	16	-10	13	19	16	13
50	50	32	50	10	29	50	-9	50	50	50	10	50	20	20	50	2	5	50	10	8	-50	50	19	-50	50	50	30	50	50	10	50	50	-1	50	11	50	50	50	10
-50	20	19	-21	9	-15	-10	26	27	-13	22	24	-28	16	13	19	15	21	19	-9	15	19	-15	-20	26	15	19	32	32	25	23	-22	-23	-26	-10	-13	-15	24	19	-26
-50	50	50	-50	50	10	-50	50	50	-50	50	10	-50	30	50	50	30	50	50	-20	50	30	-30	-41	20	-40	-20	-50	-50	40	50	-50	-41	-50	-21	-10	10	40	31	50
-22	-37	22	-50	-50	13	45	-29	33	47	-40	24	-31	-22	21	-23	26	0	1	19	35	45	14	15	18	21	50	50	50	-8	16	-18	19	24	-14	23	24	-25	-29	26
50	0	50	50	0	0	0	50	-30	-50	10	30	50	0	20	20	0	20	20	0	0	0	0	-20	-30	50	25	0	0	0	40	50	50	-30	-1	-20	0	50	50	-50
-34	13	25	-16	16	16	-17	18	33	-12	23	11	-18	10	28	5	7	26	3	6	23	3	14	-18	-4	16	33	-12	10	27	-5	-9	-5	5	-5	-7	3	25	28	-5
47	44	45	45	26	23	24	14	13	13	16	16	14	46	46	45	40	39	38	40	38	38	38	38	48	29	27	21	25	25	25	25	25	16	11	15	15	13	13	
-30	31	-29	19	-24	18	-23	-21	-24	-36	35	-30	-13	11	10	11	9	-33	31	-22	24	-10	19	22	31	-14	-11	-9	-39	-35	-40	-33	-37	-29	36	-24	-24	-23	-43	39
20	40	39	0	50	50	0	50	50	50	50	0	-50	50	50	11	30	30	30	50	0	0	0	0	0	0	0	10	20	0	0	19	19	0	0	0	11	9	9	0

81	82	83	84	85	86	87
48	-14	-16	15	14	34	25
-10	50	-11	-10	-10	-10	-11
50	50	50	10	20	50	0
0	0	0	0	0	0	0
3	4	4	4	2	4	1
28	3	1	50	50	50	50
-50	5	5	7	-10	31	41
47	21	-11	40	42	47	42
31	41	41	50	50	50	50
44	50	47	50	47	47	50
40	20	20	21	23	50	50
47	-22	17	41	31	47	47
0	50	50	-50	-50	20	50
29	19	20	40	39	40	39
10	40	10	30	-30	40	30
-20	-21	-21	20	17	23	32
24	21	21	-16	-25	14	14
47	-34	-14	22	39	47	45
-37	18	26	-13	6	-8	-10
50	50	50	-50	50	-50	50
31	50	50	10	5	41	30
41	30	40	40	31	44	24
-31	10	10	10	10	10	10
30	50	50	15	15	50	50
41	50	50	50	50	50	50
9	21	16	19	19	20	25
10	-20	-21	20	19	50	50
-19	18	21	23	22	1	21
0	50	10	-30	-20	10	50
30	30	-31	-6	1	2	35
0	50	0	50	50	50	50
16	24	24	25	27	29	29
25	13	25	33	37	37	33
-25	31	-16	21	-26	25	23
0	31	30	20	0	0	0

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
176	3	3	2	2	3	200	5	100	40	1	50	2	10	50	20	50	50	32	50	-21	50	-50	-10	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
177	2	2	2	2	4	22	5	50	20	1	2	2	1	1	-15	-14	13	5	-28	-17	10	-9	7	-7	-5	-8	8	9	-16	18	14	-11	8	8	-47	19	19	-31	29	36
178	3	3	2	2	4	100	30	19	80	1	29	2		-3	-3	-3	-3	-3	-3	-4	21	-4	10	0	10	30	-1	0	0	0	0	0	-2	0	0	0	0	0	0	0
179	3	3	1	1	5	74	0	49	100	1		2		1	-50	50	1	50	50	1	25	-50	2	25	25	25	25	-25	-25	50	50	-50	50	-50	-50	50	25	25	50	25
180	2	2	2	2	3	150	30	100	77	1	25	2		-35	-8	24	50	31	-23	11	50	-10	-7	-50	50	50	50	23	-38	50	50	16	50	8	-36	50	50	-24	50	50
181	4	2	1	1	3	22	19	40	20	1	20	2		20	-20	-11	31	20	30	20	40	-20	5	-10	19	21	50	-50	-50	41	21	-21	50	-50	-50	50	49	-21	30	30
182	5	5	2	2	3	5	76	49	10	1	20	2		-50	-50	0	0	0	0	0	0	-25	0	40	41	41	25	-10	10	26	50	25	41	-5	0	50	50	0	26	41
183	3	2	1	1	2	24	2	2	2	2	5	2	2	10	32	10	-10	10	-20	20	21	30	20	21	30	10	40	20	-31	30	40	20	31	20	-31	20	31	-21	30	31
184	3	3	1	1	5	40	25	25	50	1	45	2	0	-25	-50	-50	-30	40	0	-50	5	-10	25	15	35	10	5	40	5	45	10	5	50	50	-5	50	10	5	0	25
185	5	3	2	2	3	50	30	30	40	1	40	2	0	11	0	11	50	21	35	0	25	0	0	10	10	50	50	-37	-50	50	50	-50	50	0	-50	50	50	0	50	50
186	4	3	1	1	4	20	0	50	0	1	50	1	50	0	0	0	30	0	20	-30	0	-31	0	0	31	31	45	-21	-50	50	50	26	50	-24	-50	50	50	30	50	50
187	3	3	1	2	4	75	1	100	1	1		2		-50	-50	-50	10	30	20	-31	30	0	-1	50	30	30	0	-50	-50	50	50	50	50	-50	-50	50	50	0	50	50
188	2	2	1	1	1	52	0	80	0	1	10	2	0	0	0	30	30	30	20	-1	30	0	-20	0	10	20	0	0	0	10	20	0	10	10	0	10	10	0	20	10
189	4	4	2	2	3	20	2	100	39	1	30	2		41	11	10	10	21	21	-20	20	-20	10	50	30	50	-42	-41	-41	30	30	31	-42	-41	-41	40	41	40	32	30
190	3	4	1	1	4	150	30	40	30	1	20	2		25	26	35	34	50	36	-10	13	-10	-25	43	42	41	42	36	-46	41	41	50	38	36	-50	33	35	-26	44	44
191	3	3	1	1	5	50	0	100	0	1	30	2	0	-50	50	0	30	50	40	-6	24	15	0	50	33	27	50	-50	-50	50	50	27	50	-50	-50	50	50	4	50	50
192	4	3	2	2	4	35	0	10	60	1	40	2	0	-50	-50	-40	10	0	-20	-10	0	-25	0	40	30	30	10	25	-10	50	50	40	30	20	-10	50	50	40	25	25
193	6	3	1	2	3	200	0	81	61	1	42	2	0	30	50	31	40	0	20	-1	21	-30	0	20	11	31	-21	31	30	0	0	0	-20	30	-30	0	0	0	0	31
194	4	3	1	1	3	4	0	2	0	1	20	2	0	20	-31	-41	9	20	49	19	19	-32	40	-21	31	-32	-50	19	-50	-50	29	-50	-50	19	-50	-50	30	-50	-50	31
195	4	4	2	2	3	63	0	91	9	1	40	2		-32	-31	-31	-32	20	10	-21	-22	-50	-2	-22	18	24	-50	-50	-50	9	41	-41	-50	-50	-50	9	40	-42	-50	-50
196	4	3	2	2	4	70	0	75	25	1	30	2		10	25	10	35	40	15	20	25	5	-15	50	40	30	50	10	-41	50	50	20	50	10	-50	50	50	20	40	40
197	3	3	2	2	4	125	0	50	19	1	41	2		-21	-22	-50	-31	-31	0	0	0	-21	41	-31	41	11	40	40	-50	30	40	0	50	41	-49	44	38	0	46	47
198	3	2	2	2	5	85	19	19	50	1	41	2	0	0	25	41	50	50	10	-35	-50	-50	-41	-31	40	20	41	20	-41	50	50	41	0	30	30	50	50	41	20	41
199	4	4	1	2	3	112	31	50	19	1	10	2	21	14	25	33	36	41	28	22	34	13	16	11	10	42	-5	17	34	-3	6	24	17	12	16	6	14	29	7	12
200	5	4	1	1	2	100	2	50	50	1		2		10	30	50	50	50	30	30	31	10	-20	50	50	50	10	31	-50	10	40	11	10	30	10	10	41	11	11	50
201	2	2	1	1	3	1	0	2	5	1	-10	2	0	35	10	10	5	20	-5	20	20	5	-5	50	50	20	40	30	-30	50	50	30	36	10	-30	50	35	20	50	30
202	4	3	1	1	3	25	0	95	0	1	30	2	0	20	20	20	30	30	50	40	40	20	-11	10	20	30	30	30	10	30	30	31	41	20	10	41	40	40	30	30
203	4	4	1	1	4	48	0	20	81	1	30	2		0	0	21	32	30	10	0	0	0	0	41	50	50	50	-50	-50	21	50	0	50	-50	-50	20	50	0	30	50
204	4	8	1	3	5	29	6	42	50	1	24	1	35	10	23	-26	16	2	17	26	40	27	1	9	32	6	20	20	-20	41	41	41	30	20	-22	40	40	41	30	29
205	6	3	2	2	4	76	9	39	40	1	39	1	40	39	40	50	50	50	30	50	50	41	0	0	40	50	0	40	40	0	40	50	0	50	0	0	40	40	9	40
206	3	3	2	2	4	75	1	80	15	1	50	2		-31	20	30	40	1	20	-1	10	-41	41	45	45	45	20	40	30	45	50	30	41	-4	-11	50	50	35	50	40
207	4	3	2	2	4	87	1	75	24	1	20	2	11	-5	6	12	-11	32	-3	7	16	-34	14	13	24	27	31	11	-37	21	14	4	14	15	-13	10	10	10	10	2
208	6	4	1	1	4	25	0	100	0	2	0	2	0	0	0	0	0	0	0	-1	-1	0	0	50	32	-50	50	41	-50	50	40	-31	50	-50	-50	50	40	0	50	40
209	6	3	1	1	4	25	0	90	10	1	50	2	0	0	0	10	40	20	0	0	0	-40	-20	50	25	-20	50	-50	-50	50	50	-30	50	-50	-50	50	50	-25	50	50
210	4	3	1	1	4	104	2	100	0	1	50	1	42	-20	-31	-31	40	-31	-31	-31	-32	-50	20	21	-11	42	50	43	-50	50	50	32	50	50	-50	50	50	32	50	50

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
50	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50	50	50	50	10	32	-48	10	-41	50	50	28	50	50	50	5	6	17	-11	5	26	50	50	50	
-18	26	20	-22	28	34	5	13	-19	10	23	-10	-11	21	22	-16	21	21	19	25	22	9	12	14	12	14	13	10	10	12	5	16	13	18	25	17	11	4	6	5	
0	0	0	0	0	0	0	0	0	0	0	0	0	-2	1	0	0	0	-1	0	0	0	-1	0	0	2	3	-2	-2	2	2	2	2	1	0	0	0	0	20	19	
25	50	50	50	50	2	25	50	50	50	50	1	-50	50	50	50	1	50	50	50	-1	50	50	50	1	50	50	25	1	50	50	50	50	50	50	1	1	50	50	1	
-15	50	32	-5	40	28	-44	50	47	50	50	20	-50	50	50	50	-50	50	50	-50	-4	50	-34	-14	50	-39	13	-35	48	50	50	-38	43	-39	50	-32	39	36	37	50	
-10	31	31	-11	41	40	-50	49	48	-10	49	-50	-50	31	31	8	19	41	41	41	13	42	-48	-45	-20	-21	-20	-41	20	-11	-11	-50	-50	-50	-50	-31	-22	4	10	10	
41	41	31	0	50	0	0	26	50	0	50	0	0	10	25	10	10	10	25	0	0	0	0	31	0	0	0	25	25	25	26	41	41	0	0	0	0	0	0	0	
6	35	30	-5	40	30	-10	40	45	-20	30	25	-9	30	26	-8	31	25	-4	10	21	4	-41	-50	22	5	15	-10	-10	5	-17	6	15	6	-15	-26	5	-10	-20	10	
25	25	40	15	50	-5	5	50	10	4	50	25	-5	25	25	25	50	-5	25	50	-5	50	-25	40	15	0	5	15	35	5	-2	20	20	50	50	15	5	45	45	25	
0	50	50	0	50	50	0	50	50	0	50	50	-50	50	50	0	0	0	0	50	50	0	0	0	0	10	20	0	0	50	21	10	10	0	0	21	0	50	50	50	
50	49	50	30	50	26	-25	50	50	30	50	-21	-21	0	0	0	-50	-50	-20	0	0	0	-50	-19	-19	-50	20	-28	41	19	-10	31	30	-50	-50	0	0	24	26	0	
10	50	50	0	50	25	0	50	50	0	50	-50	-50	50	0	0	50	20	20	10	20	30	-50	-20	0	0	50	-42	30	-20	-50	-50	-50	-50	-50	-50	-50	-50	50	20	
0	20	10	0	10	10	0	10	10	0	20	10	0	0	10	0	0	0	0	0	0	0	0	0	10	0	0	0	10	0	10	0	10	0	20	0	0	20	20	0	
31	30	30	30	50	50	49	41	41	42	-41	-43	-39	-41	-40	32	-21	-20	41	-22	-22	-26	-21	-21	-20	37	33	41	40	-21	-20	-20	-21	-21	-20	-20	-21	25	21	21	
12	38	36	-34	40	40	-50	33	39	15	45	26	-50	25	25	36	12	14	40	27	26	18	-6	-6	37	41	37	31	50	10	26	40	45	-31	-20	-26	-18	37	29	10	
12	50	50	0	50	30	0	50	50	18	50	-31	-44	50	0	16	50	0	50	50	0	50	-31	-26	-12	-20	50	-50	35	-20	-27	-50	-28	-50	-26	-50	-34	-50	50	21	
10	25	25	20	20	30	10	50	50	40	30	20	-10	40	40	40	40	10	20	30	0	20	-10	-10	5	30	30	-30	5	0	-10	-10	-10	0	0	5	5	0	10	0	
9	0	30	20	0	0	0	0	20	20	-19	32	-19	0	21	9	0	20	30	0	-21	-20	0	0	0	10	10	20	21	-20	-20	30	11	-10	-10	-50	-50	11	12	31	
-50	-50	39	-50	20	19	-50	20	19	20	20	9	-50	20	21	-11	20	-22	-32	-22	30	-31	20	10	7	-21	10	19	10	20	9	10	-21	-11	-31	10	-21	20	20	-21	
9	-50	-50	9	-50	-50	-50	50	50	-50	-50	10	30	10	10	50	9	10	30	6	6	50	14	9	12	40	41	-21	-21	50	11	50	50	50	50	9	10	41	40	3	
10	50	20	10	50	10	0	50	50	30	50	10	-50	50	30	30	40	30	40	40	20	30	-50	-30	10	30	30	-30	-30	40	10	30	30	40	40	-25	-25	40	40	4	
45	43	43	42	45	43	45	47	46	46	50	44	-48	43	41	41	-2	21	50	32	36	34	22	-21	-33	28	30	-36	-28	21	19	18	36	-26	23	-37	0	0	0	0	
20	50	41	10	50	20	0	50	41	25	50	20	0	0	0	0	10	-20	40	0	0	0	25	25	50	-50	10	-41	0	5	-30	-50	-50	-36	-10	-50	-41	30	10	0	
37	3	8	24	9	19	45	3	12	27	15	37	43	6	15	38	12	23	43	18	28	30	8	21	25	24	10	27	36	26	19	27	9	34	16	18	18	17	41	19	
20	10	41	10	20	20	41	10	41	21	10	19	10	9	20	50	-50	20	50	-50	10	50	20	20	9	31	10	-10	20	10	-10	-10	-12	-10	-11	50	50	20	-10	50	
20	50	40	15	50	10	-5	50	50	20	50	15	-30	10	5	-10	50	10	-15	15	10	6	-36	-26	5	-36	-27	-27	10	-30	-27	0	0	-10	0	-30	5	-50	-5	-35	
30	50	30	30	50	10	0	31	30	31	50	0	0	0	41	50	0	50	50	0	10	50	-40	-10	10	41	31	30	31	20	20	31	30	30	31	30	41	50	50	20	
40	20	50	21	-50	41	30	20	50	0	50	-50	-50	0	0	-2	0	21	41	0	0	0	20	-50	-31	-21	0	0	21	41	-31	0	0	-50	0	0	0	20	0	50	
18	44	33	16	45	26	0	40	39	19	49	24	-14	42	-14	42	43	23	45	28	-14	30	10	-16	23	20	-18	-35	12	-9	0	-26	0	-9	0	-13	0	-19	38	-15	
41	0	40	40	0	40	41	50	50	50	50	50	50	50	30	50	50	50	50	50	50	50	0	0	0	50	50	50	30	50	50	0	50	30	30	0	30	50	50	0	
30	45	40	40	41	41	20	20	50	30	50	30	10	45	45	40	50	30	45	20	41	50	-31	30	30	-45	20	-31	-11	0	-41	-41	-21	-31	-31	-11	10	-21	9	-42	
-17	11	14	-16	11	30	-5	16	15	9	6	15	25	10	20	22	14	7	26	21	8	17	19	10	29	26	16	28	43	12	27	9	9	13	33	18	26	20	11	37	
-50	40	50	-40	50	30	-50	50	50	-50	50	-50	-50	50	20	-50	50	30	30	50	30	0	0	0	1	-50	-50	-50	-50	0	0	0	0	0	0	0	0	0	0	0	0
-40	50	50	0	50	50	0	50	50	0	50	0	0	50	50	25	50	50	50	0	50	50	-50	-25	50	20	10	-25	20	-40	0	0	0	-50	-25	-40	-15	-25	20	-25	
33	50	50	32	50	50	31	50	50	34	50	31	-50	50	50	50	50	50	50	50	50	50	18	15	15	40	40	-21	-20	41	41	40	41	19	38	-20	-20	32	30	36	

81	82	83	84	85	86	87
50	-48	-48	47	42	50	50
17	16	24	-16	-20	-17	-16
17	28	27	26	28	26	26
25	50	50	50	50	50	50
48	50	50	50	50	50	50
10	31	30	10	9	31	30
0	41	0	50	0	50	25
-5	20	15	20	25	5	-10
-15	3	0	50	50	25	50
50	50	50	50	50	50	50
0	0	-21	26	0	-25	50
-50	50	50	-50	-50	-50	-50
10	0	0	10	10	10	10
-20	30	-9	30	32	50	49
-10	42	32	31	20	50	50
-35	50	50	-50	-50	-22	-22
0	40	25	0	0	10	20
19	31	22	30	30	42	11
9	30	30	30	9	30	30
3	50	50	9	11	50	50
4	50	50	40	40	50	50
0	0	0	33	0	-24	20
0	50	50	41	41	40	41
14	16	16	10	7	9	28
21	50	50	50	31	50	31
0	25	25	25	25	15	15
20	50	50	50	50	50	50
-50	0	0	31	-50	50	50
27	39	-10	11	0	9	0
0	50	50	50	50	50	50
20	50	50	41	41	50	50
17	11	30	14	22	7	28
0	20	20	50	50	50	50
0	0	0	0	10	30	-35
26	50	50	31	35	50	50

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
211	5	4	1	1	3	30	0	50	50	1	31	2	0	-50	-50	-41	-41	31	20	-50	-50	-31	0	31	10	10	50	25	-25	50	25	25	40	20	0	50	25	25	50	50	
212	2	1	2	2	2	50	8	44	97	1		1	17	-24	8	26	50	50	50	-19	50	-22	50	50	28	-25	43	35	-21	31	10	11	-18	21	19	10	-17	32	15	-10	
213	3	3	2	2	3	80	11	28	5	1	40	2		34	26	-18	20	5	8	41	28	16	43	18	9	16	9	15	18	1	3	6	2	3	3	5	14	8	10	23	
214	5	8	1	1	4	23	0	80	30	1	30	2	0	-31	-31	20	31	20	40	-30	29	-20	-31	50	50	20	-50	-50	-50	50	31	-41	-50	-50	-50	50	30	-32	50	30	
215	6	4	1	1	6	102	0	50	50	1	24	2	0	0	10	10	40	50	0	0	0	-11	-41	40	10	21	0	50	50	10	50	20	0	50	20	20	50	10	9	50	
216	4	3	2	2	0	25	0	90	50	1	40	2		-30	-50	0	50	50	30	-50	10	-50	0	40	50	50	0	10	11	50	50	50	50	50	-1	50	50	50	50		
217	5	3	1	1	2	23	9	49	50	1	25	1	24	30	30	36	50	50	41	26	36	-26	25	0	30	50	-6	26	50	-20	25	50	50	50	50	5	24	50	6	25	
218	5	3	1	1	2	32	0	31	1	1	0	2	0	21	0	0	12	11	47	20	-1	-19	8	50	24	0	45	21	-32	50	16	10	50	32	-21	50	41	23	34	26	
219	4	2	2	2	3	117	0	90	10	1	31	2	-22	10	0	11	50	25	50	-27	-30	-31	-10	0	13	50	50	50	50	0	0	0	-2	0	-2	0	0	-2	0	20	
220	5	3	2	2	4	98	22	55	8	2	22	2	11	18	-21	-16	12	22	20	45	43	48	19	-9	9	46	15	-15	39	-10	-9	44	-8	-9	31	-11	-8	31	26	26	
221	3	3	1	1	2	9	20	50	78	1	10	2	0	0	10	0	25	25	10	0	10	10	10	20	20	50	10	20	0	50	50	20	30	20	0	50	50	-10	50	50	
222	4	3	2	2	3	74	3	60	29	1	40	2	0	21	-22	-20	20	30	10	-10	30	-30	0	30	29	20	20	-10	-21	41	10	11	40	10	-11	40	21	21	30	30	
223	3	3	2	2	4	23	0	100	100	2	1	2	0	0	-50	0	0	50	0	-1	-1	0	0	50	50	0	0	0	0	0	0	0	0	50	0	-50	50	50	-50	50	50
224	2	2	2	2	1	100	10	100	30	2	40	2	0	15	10	15	-10	50	10	25	50	40	-10	20	1	-40	5	14	7	7	-5	-7	-8	6	-17	-17	-16	-17	5	2	
225	6	4	2	2	4	4	0	81	19	1	41	2	0	-50	10	10	20	50	20	-10	-10	-11	-10	30	30	41	0	0	0	41	50	-10	0	0	0	50	44	-10	50	40	
226	5	3	2	2	1	175	3	39	51	1	22	2	0	-47	-49	-50	-50	-11	41	0	0	-41	-19	11	10	10	9	0	-48	31	29	-40	48	30	-50	49	48	-49	21	40	
227	5	5	1	2	4	100	50	50	50	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
228	4	3	2	2	4	103	91	4	90	1	31	2		40	19	-31	20	30	20	-21	30	-26	11	40	19	30	40	40	40	40	40	10	39	40	10	40	40	30	40	40	
229	4	3	2	2	3	54	0	91	3	1	35	2		-21	-21	-21	11	-20	13	-22	21	-12	-9	19	20	9	41	0	-17	41	20	0	41	-11	-41	50	50	0	50	30	
230	4	4	2	2	7	191	93	96	96	1	44	1	45	45	48	47	46	46	48	47	44	46	44	41	44	46	43	43	45	41	43	-37	34	19	-29	-14	-17	33	-25	-31	
231	3	2	2	2	4	125	50	51	50	1	41	2		-30	-42	-9	30	9	-31	10	11	-11	-21	40	40	40	50	50	-50	50	50	21	41	41	-41	40	41	9	20	22	
232	5	5	1	1	3	1	0	100	9	1	41	2	0	0	11	0	31	31	30	31	30	31	10	-4	-4	-4	-3	-2	-4	10	10	10	-7	-5	-4	10	10	10	-4	9	
233	3	3	1	1	4	35	0	50	9	1	30	2		10	20	20	21	10	32	10	40	-11	-11	41	31	-30	40	9	-40	31	50	20	40	10	-40	41	29	10	50	32	
234	2	2	1	1	1	65	5	80	20	1	2	2	-2	-50	-40	10	-50	20	50	10	-31	-21	0	50	50	-10	50	20	-50	50	50	-11	50	29	-50	50	22	-41	50	50	
235	3	3	2	2	4	190	49	39	50	1	30	2		20	40	10	41	37	43	-10	20	-10	-11	31	38	39	41	11	-31	50	43	10	41	15	-32	50	42	-26	50	33	
236	3	2	2	2	2	1	0	50	50	1	45	2	0	-50	10	-50	0	10	-10	20	40	0	10	50	-20	-10	10	20	30	30	0	20	20	-10	10	50	20	40	9	30	
237	2	2	1	1	3	20	0	23	23	1	15	2	20	0	0	0	0	0	0	-1	-1	0	0	0	0	2	0	0	1	1	0	0	0	0	-2	0	0	0	0	0	
238	2	2	2	2	4	15	70	20	10	1	50	2	0	-50	50	0	0	50	-50	-50	20	-50	0	-50	50	-20	40	20	-40	40	40	-40	50	-20	-50	40	40	-40	30	40	
239	5	5	1	1	4	49	0	99	1	1	-21	2	0	5	-50	-31	41	41	20	-50	-50	-50	32	-31	31	10	0	41	0	39	40	10	50	50	40	50	50	26	10	30	
240	4	4	1	1	3	52	0	10	3	1	9	2	0	0	0	0	0	11	14	-7	22	-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
241	4	4	1	1	5	98	19	49	70	1	50	2	-1	0	0	-20	0	50	-50	-50	10	20	-49	20	50	31	-21	50	41	20	50	41	49	50	50	50	50	50	19	50	
242	2	3	2	2	8	24	0	27	2	1	8	2	-8	9	6	50	50	28	43	22	28	-6	-20	-33	26	41	50	-17	-20	50	-18	-34	50	-33	-50	25	-29	-6	24	35	
243	4	4	1	1	3	1	3	100	50	1	31	2		-29	-17	-22	-32	-10	10	16	32	-23	-22	-29	9	-28	-26	-28	-29	-31	-30	-28	-22	-21	-21	-24	-25	-24	-30	-30	
244	4	3	2	2	3	125	29	29	30	1	20	2		-41	-41	0	41	41	21	-11	-1	0	9	41	30	30	9	0	-41	41	39	10	41	0	-40	41	40	20	40	30	
245	4	4	1	1	3	150	1	100	100	1	40	2		-10	20	-10	30	30	10	20	20	-40	10	1	10	20	50	50	-50	50	50	25	50	50	-50	50	50	50	-10	20	

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
50	50	31	31	50	30	30	50	50	50	50	-20	-20	50	50	50	50	50	50	50	50	0	10	10	10	10	10	-31	-50	20	20	-50	-50	-50	-50	-10	-10	-30	-30	-50	
31	25	21	23	30	27	6	12	-14	26	-26	-37	-32	29	-21	21	14	22	31	8	-12	19	9	-7	19	17	19	-32	25	20	24	25	31	21	19	34	42	28	50	24	
13	11	14	14	19	24	11	-10	-9	-21	-18	-17	-17	-23	-15	-8	-20	-10	-8	-12	-17	-21	-22	-14	13	20	30	-39	-33	20	-31	-9	-15	15	21	-15	-15	14	10	-20	
-41	50	30	-50	50	31	-50	50	30	-49	50	31	-50	50	31	-31	49	31	0	30	10	-31	-39	-40	-40	-40	-41	40	40	-40	-42	0	0	-2	0	0	0	41	41	-10	
9	9	50	9	50	40	20	0	50	0	0	50	9	39	24	31	10	41	50	10	21	50	40	20	31	30	0	0	0	50	-20	-50	-50	-10	-10	-20	-21	0	-11	-50	
0	50	50	0	50	50	50	50	50	50	50	50	0	0	50	0	0	50	50	0	50	50	0	0	50	50	50	-50	-50	0	0	-10	-23	-21	-21	-40	-40	50	50	-30	
50	5	24	50	50	35	5	0	25	50	14	24	50	36	14	50	-16	24	50	14	20	50	5	26	50	25	20	50	25	50	40	25	10	31	41	10	7	50	50	25	
15	50	40	9	50	16	3	50	15	9	50	0	-50	50	1	-29	0	25	17	16	26	39	-50	-21	19	35	41	41	23	26	-6	0	0	0	45	0	0	40	13	30	
50	0	50	50	32	19	50	0	-1	0	29	30	33	20	21	23	0	41	30	1	-2	0	50	18	10	-32	-18	50	0	19	21	50	50	50	-23	-19	17	-11	0	0	
38	15	-11	44	-11	16	33	-10	14	27	13	20	40	22	21	31	-10	9	36	24	26	34	-9	13	27	32	24	24	33	17	16	23	21	31	34	22	27	19	18	27	
10	50	50	10	50	50	20	50	50	10	50	50	0	50	50	0	10	20	50	10	25	50	-10	-50	10	25	-25	50	0	25	10	50	25	-10	-10	0	0	20	20	20	
11	40	21	9	30	0	-20	30	11	10	41	-12	-10	30	10	20	-21	-21	-21	30	12	20	-32	-21	-11	11	31	-31	-11	-20	-11	0	0	0	20	-21	10	29	10	19	
-50	50	50	-50	50	0	-50	50	50	-50	50	-50	-50	50	50	0	50	50	50	0	0	1	50	50	50	50	50	0	0	0	1	-50	-50	0	0	-50	0	50	50	0	
-2	-11	8	7	25	14	40	-15	-8	-21	-50	31	50	-31	50	50	-14	12	13	-33	27	50	-20	19	38	15	20	-5	50	50	50	50	-11	-2	-1	-3	21	-11	32	-3	
0	50	21	-10	50	20	-10	50	50	-10	50	10	-11	50	49	40	30	31	30	20	10	10	-10	10	10	-11	0	-11	-11	-10	-11	-21	10	-11	-11	-10	-10	-10	-10	-11	
20	41	41	-21	44	34	-48	41	41	-31	41	40	-49	30	45	7	19	40	44	9	31	44	20	13	-30	-1	-11	-42	-43	-30	-31	-42	-43	-39	-43	-49	-49	19	20	-50	
0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	2	1	0	0	0	0	0	0	1	0	0	0	2	2	0	1	1	1	2	2	0	2	0
40	50	50	10	20	20	50	40	40	40	39	41	40	30	30	30	9	29	50	20	41	41	19	-40	-21	40	40	40	40	20	20	10	10	30	30	9	11	30	32	-10	
0	50	40	0	10	40	0	50	41	0	40	0	0	30	10	0	40	31	32	41	31	30	0	0	41	-11	-10	-11	-11	3	2	0	0	-16	-4	0	0	0	0	0	0
24	-17	-22	30	14	-24	15	-8	8	-15	22	7	-11	32	32	30	0	0	-1	33	31	31	31	-13	-12	32	34	38	38	38	38	35	38	37	-22	-19	40	28	22	12	
21	40	41	42	10	12	10	50	50	0	50	42	-41	41	31	50	41	41	50	40	50	50	-21	-20	-20	10	40	-40	20	40	0	-31	-31	-30	-30	11	10	0	31	-2	
11	-6	9	9	-4	-3	-5	-5	-5	-5	-4	-5	-5	-5	-4	-5	-5	-5	-5	-6	-6	-6	-4	6	-6	11	32	21	21	21	20	21	20	21	20	20	20	21	20	22	
-10	41	21	0	13	19	8	32	44	28	35	-17	-33	14	14	8	14	9	10	-25	21	9	24	40	16	-32	38	-39	36	34	-19	-25	16	-34	25	-36	3	26	49	20	
-50	50	50	-50	50	50	-50	50	50	-41	50	-20	-50	50	50	-22	50	20	-21	0	0	0	-50	-50	50	-1	50	-50	20	50	0	-1	-50	-50	-50	-50	-50	-10	10	10	
14	50	38	-10	50	46	10	50	50	20	50	10	-31	44	42	37	38	34	50	16	28	38	-37	-32	20	24	50	-11	47	41	20	10	10	-41	-35	-20	10	20	45	44	
40	40	20	0	10	20	30	10	40	30	30	-10	10	40	19	30	40	-10	30	40	9	50	-40	-30	-40	0	20	9	20	40	-30	0	0	-20	0	0	10	10	50	50	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-40	30	40	-40	40	40	40	20	40	20	50	-50	-50	0	0	0	40	0	40	0	0	0	-20	-40	20	0	40	-40	-40	-40	-40	-40	-40	-40	-40	-10	-10	20	20	-20	
0	0	21	1	10	5	-19	50	50	3	50	31	5	-50	-50	-50	0	0	-1	-50	-50	0	-22	-44	27	0	0	10	10	4	0	-42	-42	-41	-40	-41	-44	31	34	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	14	0	0	18	8	14	14	16	22	19	15	-19	-22	-20	
20	50	50	50	50	20	30	50	50	50	31	40	31	50	50	50	-11	-1	49	50	9	50	10	-50	10	30	50	10	50	50	50	50	50	-1	29	0	30	50	50	-31	
27	24	29	31	50	29	50	41	32	-15	50	12	-21	50	19	50	1	20	50	10	14	50	49	31	-19	35	50	-27	-24	-13	-7	-3	6	-20	-2	30	50	-2	26	-25	
-32	-21	-21	-20	-17	-20	-20	-21	-21	-20	-19	-20	-20	-15	-21	-21	-24	-19	-26	-17	-20	-15	-19	-19	-21	10	10	-11	-11	-12	-12	-3	-4	-6	-6	-6	-6	-8	-6	5	
19	40	41	19	30	30	30	41	40	20	41	0	-41	20	20	30	20	30	30	10	20	30	-11	-20	-11	20	19	0	0	20	0	10	10	0	10	0	0	10	0	0	
10	30	20	10	20	30	10	50	50	10	50	-1	-50	50	50	50	25	-50	50	50	1	25	0	30	-30	50	50	-10	50	25	50	-50	-25	-50	-25	50	50	-10	50	5	

81	82	83	84	85	86	87
-50	30	30	30	30	50	50
27	14	36	8	28	38	50
-24	-15	18	12	11	12	14
-11	50	50	20	20	20	21
-50	10	11	11	10	20	20
-31	50	50	50	50	50	50
26	50	10	30	25	24	41
7	46	26	43	32	39	33
0	21	12	0	0	24	11
27	27	37	27	29	48	28
0	-10	-10	-10	0	50	50
9	40	40	40	39	20	40
0	50	50	50	50	0	0
50	50	50	30	30	50	50
-11	10	10	10	21	20	19
-50	-11	-50	-31	-10	21	9
0	0	1	0	0	1	1
-11	20	20	50	50	50	25
0	-2	0	0	0	0	0
4	10	5	4	38	2	40
1	10	10	41	41	10	10
20	21	22	21	21	22	21
20	37	45	50	50	50	50
30	50	50	10	11	50	50
11	50	50	50	50	50	50
10	30	10	50	50	10	50
0	0	0	0	-2	0	0
0	40	40	-50	-50	-50	-50
0	22	24	-36	-35	-35	0
18	-33	-40	21	34	43	44
-1	20	30	50	50	0	50
-8	50	50	-17	-10	40	46
7	6	5	-6	-5	-9	-6
0	30	30	30	30	10	20
5	50	50	50	-1	50	-1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
246	3	3	1	1	3	31	4	28	1	1	4	2		-20	-31	-24	4	2	32	-14	-16	-17	18	7	3	-10	15	-15	-39	35	19	-12	36	15	-12	13	-6	-20	18	16	
247	4	4	2	2	3	23	90	10	90	1	50	2	-1	10	-50	10	40	50	40	20	40	10	10	40	50	40	50	-10	-50	50	50	50	50	-50	-50	50	50	50	50	50	
248	4	4	1	1	3	4	0	1	1	1	20	2	0	-50	-50	-50	-50	-31	21	0	0	0	20	20	41	20	50	-20	-50	50	50	-50	50	-21	-50	50	30	-50	50	30	
249	3	3	2	2	3	25	1	100	20	1	-11	2		31	-50	-5	30	-11	-3	36	50	-7	37	36	42	50	-48	-48	-50	3	50	5	-48	-49	-50	-46	47	-17	50	50	
250	2	2	2	2	3	18	0	97	19	1	40	2	0	-17	-30	17	16	0	9	-24	14	-37	-15	-16	4	16	14	-33	-35	13	14	-25	14	-6	-35	19	2	-27	16	10	
251	2	3	1	1	4	7	0	39	60	1	40	2	0	-31	7	10	0	-10	-31	10	10	30	-31	0	31	18	41	20	-11	27	30	24	41	10	-10	44	17	-11	40	41	
252	2	2	2	2	2	22	0	100	0	1	25	2	0	-30	-50	-50	32	10	0	0	0	10	0	0	31	10	20	10	-50	41	31	-50	30	18	-50	41	31	-50	40	41	
253	2	8	2	2	3	30	6	44	23	1	26	1		-11	-46	-17	12	18	-16	6	19	-12	7	27	-20	25	34	-11	0	16	27	33	33	0	0	40	10	-12	32	17	
254	3	3	2	2	3	10	0	40	9	1	50	2	0	-50	-50	-50	46	34	-12	17	13	0	16	33	18	33	-11	14	15	50	50	40	-11	14	15	50	50	40	50	25	
255	4	3	2	2	1	90	0	90	60	1	50	2	0	-20	-10	31	-10	10	10	10	10	10	-26	20	25	35	-10	20	-25	-21	30	-21	-11	41	-31	-11	40	-30	10	36	
256	3	3	1	1	3	10	5	94	1	2		2		20	-21	20	-20	30	30	-11	-11	-20	-20	10	10	20	20	22	25	10	31	41	10	16	22	50	50	50	8	12	
257	4	3	2	2	4	115	20	70	10	1	40	2	0	-43	0	-34	-34	30	0	-43	43	-50	-50	20	41	20	30	10	-50	21	20	9	41	30	-50	20	20	10	30	20	
258	5	4	1	1	4	73	0	9	4	1	0	2	20	0	0	1	9	4	50	10	0	0	0	0	10	10	0	9	0	0	10	0	0	-2	10	0	-1	21	9	0	0
259	3	3	2	2	8	200	100	100	99	1	50	1	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	50	50	39	30	31	40	29	30	29	30	29	31	30	
260	2	2	2	2	2	5	2	40	30	1	-20	2	10	11	-23	14	36	-31	50	24	24	20	26	37	22	32	31	36	-17	-22	21	-26	-20	25	-22	25	38	16	21	41	
261	5	5	2	2	4	20	0	80	10	1	30	2		-50	-50	-50	19	-10	30	-31	20	-42	40	30	20	20	-32	50	0	50	50	0	50	50	-11	50	50	50	-21	40	
262	3	4	2	2	3	200	2	20	81	1	39	2	-25	-37	-31	-50	20	30	15	18	13	-22	-11	14	10	22	-50	-50	-50	-50	-49	-50	-47	-49	-50	-49	-46	-48	-50	-49	
263	3	3	2	2	3	13	0	100	30	1	30	2		-31	-50	-50	21	31	10	0	0	0	20	21	40	32	50	50	0	49	50	50	50	50	-50	50	50	50	41	50	
264	4	3	1	1	4	8	1	3	1	1	-10	2		30	30	30	10	30	40	10	20	15	25	1	10	20	30	20	-30	30	20	20	30	20	-20	21	10	0	20	10	
265	2	2	2	2	5	43	0	100	50	1	45	2		-50	-50	-50	25	30	-31	-50	-50	-29	5	40	21	30	34	50	-20	50	50	50	50	50	45	50	50	50	50	50	
266	5	4	1	1	4	16	1	17	24	1	13	2		-19	-32	5	7	37	11	5	15	10	-17	31	21	40	21	31	-31	31	45	10	41	27	16	50	47	10	30	49	
267	5	3	2	2	3	87	0	80	19	1	30	2		20	20	-10	30	-10	10	20	50	0	20	20	21	-20	-30	-30	-50	-20	31	-40	21	-21	-50	50	50	-30	40	40	
268	6	3	1	1	3	0	0	0	0	1	21	2	0	0	0	0	0	0	40	0	41	-40	50	0	0	-50	0	0	-50	0	0	-50	0	0	-50	0	0	-50	0	50	
269	3	3	1	1	4	200	0	100	4	1	50	2	43	31	41	19	50	19	21	9	29	10	20	20	50	32	-11	-19	-30	-11	-2	-10	-11	2	-9	-5	18	-2	-9	14	
270	2	1	1	1	3	0	0	50	8	1	3	2	2	2	2	2	2	2	2	3	2	3	3	2	2	2	2	3	3	1	2	3	2	1	2	2	2	2	2	2	
271	3	3	2	2	1	51	1	99	9	1	41	2	-1	10	-50	50	50	31	41	30	50	-50	-50	21	31	50	-20	-20	-20	10	10	20	-20	-20	-20	10	10	20	-10	-10	
272	4	3	2	2	4	8	0	100	19	1	50	2		-50	-50	-50	0	20	50	-50	19	-21	23	0	50	-38	-50	50	20	0	50	13	50	50	-14	50	50	0	50	50	
273	4	3	2	2	5	74	9	76	9	1	35	2		-50	-50	-50	37	-50	16	-35	20	-33	-50	4	10	26	50	28	-50	50	50	-50	50	14	-50	50	50	-50	50	27	
274	6	3	1	1	1	8	0	75	25	1	30	2		0	0	0	20	0	25	0	-1	0	0	10	50	0	-1	24	0	30	40	-1	50	50	0	50	50	0	50	50	
275	6	4	2	2	4	9	50	9	80	1	41	2		21	-30	-40	10	31	-11	10	41	-31	32	10	21	-9	20	10	9	20	42	20	31	-10	-10	40	41	10	11	41	
276	4	3	2	2	3	23	0	19	19	1	50	2	0	31	0	0	20	50	0	-11	20	-10	0	21	22	49	0	0	0	0	0	0	0	0	0	0	0	0	0	30	30
277	6	6	2	2	4	75	0	70	30	1	25	2	0	-50	-50	-50	10	-25	20	-35	25	-25	0	-30	50	35	30	10	-50	25	36	0	35	6	-50	50	40	0	25	50	
278	2	2	2	2	8	41	4	19	29	1	10	2	-30	-21	-29	-20	10	50	50	-22	10	-50	31	50	31	42	-50	20	-50	-50	30	-50	-50	-50	-50	-50	-50	-49	-50	19	
279	5	8	1	1	4	128	0	18	30	1	29	2	0	-22	-50	-50	20	11	20	-21	-21	-40	-2	41	20	19	50	40	40	50	50	50	50	31	19	50	50	50	50	30	
280	3	3	2	2	2	50	0	20	15	1	30	2	0	-20	-40	0	40	0	30	20	20	0	30	20	35	10	30	30	-50	50	45	0	30	30	-50	50	50	-50	40	40	

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
-12	33	29	-10	23	23	-9	28	19	-26	20	-18	-38	10	10	-35	-33	-31	42	-1	-2	-1	-39	-35	48	-25	-39	-50	-37	9	-9	-36	-41	-50	-24	-18	-22	9	6	13
10	50	50	25	50	50	10	50	50	50	50	-50	-50	50	50	40	50	50	50	50	50	50	-20	-20	50	25	50	-10	25	50	50	50	50	10	40	40	40	50	50	50
50	50	30	50	30	50	-20	50	50	50	50	-21	20	-25	-25	33	19	25	32	0	0	0	-50	50	-20	0	-50	-50	50	50	50	30	50	-24	27	-25	-26	19	50	-31
-1	7	50	14	-48	-49	-50	-46	50	19	-46	-50	-50	-5	49	49	33	50	50	-33	-33	-26	49	-49	-49	12	16	-5	-17	6	-16	50	-3	24	-2	-6	16	36	-14	48
-17	17	13	-9	0	0	0	19	10	4	25	-14	-19	18	7	2	10	3	1	6	3	10	-11	-5	11	25	24	-6	-5	13	10	1	13	-5	5	-8	6	4	3	-2
25	43	43	45	46	0	11	39	30	20	49	10	-10	0	10	41	0	11	39	7	38	41	-1	26	41	34	20	-25	25	17	-12	22	36	-26	23	24	-29	31	0	13
-21	30	27	-9	10	26	-50	30	17	-48	42	27	-50	17	50	0	14	43	33	18	29	11	38	25	-2	-35	34	-50	-50	-25	-26	-50	21	-36	31	-20	20	10	10	-50
25	32	-24	25	29	-17	24	21	28	28	30	-15	-25	35	13	27	-16	20	-20	24	-15	38	-20	42	-9	21	14	25	-13	38	-21	39	39	-16	33	15	11	24	-6	-6
40	50	25	40	40	20	40	50	50	50	40	-10	10	21	30	50	10	30	50	-10	25	50	-20	-20	-11	-40	-45	-25	30	50	50	15	38	0	0	27	27	45	38	12
20	-20	30	30	-20	25	25	-20	35	0	-20	35	-20	-20	41	50	-20	30	50	-20	20	45	-20	-20	30	30	30	0	0	40	40	30	20	50	30	10	10	25	26	20
19	50	20	2	50	20	10	50	50	50	27	15	21	40	43	50	10	28	50	20	45	50	50	29	50	-10	-11	-10	-11	12	19	20	-10	-11	-10	-11	-11	21	16	-10
-21	41	20	49	29	29	30	30	30	30	40	30	-50	9	-10	50	50	50	50	36	10	48	0	10	15	-10	31	20	0	50	48	50	50	50	50	50	46	40	50	40
0	0	8	10	0	10	12	9	10	11	10	10	11	0	0	10	0	1	0	10	10	10	0	0	0	6	7	5	5	20	11	1	7	5	10	2	3	0	0	5
28	30	30	28	30	30	29	31	30	30	30	32	30	31	31	31	30	30	30	19	-22	8	9	8	20	30	39	29	40	40	41	41	41	40	30	30	30	30	29	30
-19	-24	26	-18	-27	-24	34	33	26	-26	26	-22	22	28	-34	24	-29	37	-24	-19	33	-23	-30	29	-24	36	27	9	-14	-14	21	39	-20	35	5	34	45	29	-10	25
0	-21	40	0	20	20	20	50	50	50	50	50	21	-21	50	30	-50	30	30	-50	31	50	-31	10	30	-31	20	20	20	50	40	30	30	30	30	0	20	0	0	10
-49	-46	-48	-47	-47	-46	-47	-49	-47	-47	-48	-48	-47	-46	-44	-45	-45	-46	-45	-47	-46	-47	-47	-44	-47	-18	-17	-16	-13	-19	-22	-10	-10	-15	-20	-17	-18	-17	-13	-15
-10	41	41	20	41	41	21	50	50	50	50	30	-32	41	42	40	41	50	50	10	30	50	40	-31	22	32	33	-50	-50	20	50	41	11	-30	-30	20	20	30	47	-38
0	20	10	0	0	0	0	20	10	0	30	10	-10	10	0	0	10	20	20	0	0	0	0	10	20	-10	-20	-10	-10	0	0	0	15	-10	-5	0	0	5	0	5
40	50	50	50	50	-50	23	50	50	50	50	40	10	50	50	50	10	5	31	-20	21	40	-20	5	-16	-50	21	-40	-31	46	4	-30	40	22	50	-30	5	25	36	50
2	30	48	-29	10	32	1	15	50	9	50	21	-11	21	41	16	41	22	37	14	25	12	-32	-31	41	5	5	1	20	21	-30	-7	-13	-43	-30	6	16	11	30	-8
-41	40	21	-11	30	31	-30	50	50	-20	50	-21	-50	50	50	50	50	50	50	31	30	31	41	41	-10	21	40	10	20	30	10	41	40	10	10	-10	20	21	31	30
-50	0	20	-50	31	0	-50	31	31	-50	40	0	-50	0	0	-50	0	0	0	0	0	-50	0	-28	50	0	0	0	0	0	0	-50	-50	-50	-50	-50	-50	-50	-50	-50
0	-7	12	-2	-5	7	6	-2	16	-10	-4	16	-8	-8	14	0	-6	9	-2	-5	21	9	-8	1	1	11	5	9	13	9	15	-15	17	13	6	12	7	7	9	7
2	2	2	2	2	1	2	2	1	2	3	2	2	1	2	2	2	1	2	2	3	1	2	2	1	2	2	2	2	1	3	1	2	2	1	1	2	2	1	3
-10	-10	-10	-10	-10	-10	-10	10	9	20	-20	-20	-20	1	1	1	1	1	21	1	1	21	1	1	1	30	1	30	30	40	41	30	21	30	21	50	50	10	10	50
50	0	50	0	9	50	8	8	50	4	12	40	17	0	50	27	18	19	25	0	29	50	7	-22	-29	-21	0	-21	-20	20	-34	0	12	-14	-14	-25	-31	0	0	-50
36	19	18	37	24	25	24	50	-50	-50	50	9	-50	30	31	50	19	11	18	27	28	27	25	26	24	50	50	-50	-50	37	43	48	23	27	31	25	28	24	25	-44
0	50	50	0	50	50	0	50	50	50	50	50	0	10	10	0	0	25	0	0	0	0	0	0	0	0	10	0	5	10	10	25	10	25	25	25	25	10	10	0
11	10	40	20	10	41	11	21	41	40	21	-11	-10	41	40	41	-10	-10	41	20	10	41	21	-30	-11	20	41	-11	10	21	20	10	10	-10	-11	-9	-9	30	30	10
30	30	30	30	30	30	30	30	30	30	0	0	0	30	30	30	3	11	50	0	0	50	0	0	0	50	50	31	31	0	0	0	0	0	0	0	0	20	20	0
-50	25	50	0	50	10	0	50	50	0	50	-50	-50	40	10	50	50	0	50	50	0	25	50	50	0	30	30	0	0	0	0	50	50	0	0	-25	0	25	25	25
20	-42	-20	-31	-46	-41	-40	-39	-34	-20	-50	-50	-50	-50	-47	-21	31	24	28	-31	-28	20	-26	-21	-7	29	29	-50	-25	30	29	22	21	-19	16	-24	20	-16	44	35
31	50	29	31	50	38	40	50	40	41	50	-9	-6	0	0	0	0	0	40	0	0	0	-30	-10	-12	0	21	10	20	31	0	20	0	0	0	30	20	10	11	-22
0	30	50	-20	20	30	0	50	50	0	50	50	-50	50	50	0	40	40	35	30	30	20	-30	-30	40	-50	-50	10	20	10	0	0	0	0	0	0	20	15	40	

81	82	83	84	85	86	87
-13	11	-6	-1	-1	47	20
50	50	50	50	50	50	50
-20	35	35	0	0	50	50
-7	-6	-16	50	13	50	-14
0	27	16	0	0	12	6
18	-31	12	9	-29	4	0
-50	-15	-15	30	31	-20	50
0	18	17	-14	-13	33	39
27	45	0	13	15	50	5
20	41	0	20	20	50	50
-11	8	10	12	10	15	38
0	50	-42	1	0	50	20
5	20	20	20	20	30	31
30	30	31	30	30	30	31
29	24	35	42	35	-30	-17
9	0	0	20	20	19	41
-10	-7	-13	-7	-11	-6	-8
-50	13	-12	30	30	0	50
0	10	10	0	0	10	10
-50	50	50	-36	-40	48	48
10	20	20	11	10	43	41
30	50	19	30	30	21	41
-50	-50	-50	0	0	0	0
11	12	11	-6	12	4	4
2	2	2	2	2	2	2
50	20	30	20	20	20	10
-50	50	50	-50	-50	50	50
-24	35	41	6	7	29	21
0	0	0	10	10	25	25
31	10	10	10	31	41	40
0	9	10	0	0	50	50
25	50	50	50	50	50	50
35	-28	-27	32	-20	-11	50
21	-32	-32	50	50	50	50
15	50	50	50	50	50	50

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
281	3	2	2	3	3	73	9	9	9	1	35	1	10	20	21	31	50	30	20	21	20	30	0	41	31	20	20	0	0	0	0	30	31	0	0	41	3	0	11	21
282	2	2	1	1	4	28	40	30	30	1	31	2	0	-50	10	-30	-20	40	40	30	30	30	40	-30	45	40	10	50	25	50	30	40	50	30	-50	50	10	40	10	50
283	2	2	2	2	1	48	50	51	32	1	50	2	50	-47	50	35	36	-13	21	8	4	-8	16	-11	21	50	50	16	-50	50	42	-34	50	1	12	15	20	33	50	17
284	5	4	1	1	3	36	5	20	3	1	5	2		20	-20	-20	10	25	10	-20	-20	-20	10	30	10	20	15	10	-5	35	20	15	35	15	-10	35	20	15	25	20
285	3	3	1	1	4	90	0	55	45	1	40	2	0	-30	-50	-50	35	40	0	0	25	-40	40	50	0	30	50	20	20	50	30	30	50	-50	-50	50	50	30	50	40
286	3	3	1	2	0	25	0	50	30	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
287	2	2	2	2	3	26	0	25	25	1	50	2	0	-50	0	-50	50	10	25	10	25	-20	10	50	50	50	50	30	-50	30	50	-50	50	50	-50	50	50	-50	50	50
288	2	1	3	2	2	12	6	39	5	1	21	1	23	-29	12	-16	-26	29	50	-32	-24	50	41	19	11	27	32	26	35	17	-21	19	9	18	17	26	14	10	-11	-14
289	3	3	1	2	1	11	0	91	9	1	26	2		-45	-45	-20	-5	30	20	0	25	0	0	10	20	5	0	25	-50	50	50	35	50	50	0	50	45	40	20	20
290	6	6	1	1	4	149	20	60	20	1	35	2		0	0	0	30	40	0	-1	20	0	0	20	0	20	-30	30	0	21	20	21	30	29	-21	0	0	0	0	30
291	2	2	1	1	2	6	0	10	90	1	0	2	0	25	-20	0	10	40	50	10	50	5	0	50	50	50	-50	-50	-50	-30	-30	-30	-50	-50	-50	-40	-40	-40	50	50
292	6	6	1	1	3	4	25	5	20	1	50	2		-50	-50	50	-50	50	50	-50	-50	-50	-50	-25	-10	50	-50	-50	50	40	50	25	-50	-50	50	40	50	50	50	
293	2	2	1	1	4	19	90	45	24	1	32	2	0	23	13	-16	50	27	45	-38	-26	-37	-15	4	43	50	50	15	32	-28	14	-18	50	10	-34	50	21	-27	-37	44
294	4	4	1	1	3	6	1	6	1	1	10	2		-10	-10	-10	-10	-10	-10	-10	-10	-10	1	-10	5	10	-5	5	10	5	10	10	10	5	5	10	10	10	5	10
295	3	3	2	2	3	125	19	90	50	1	50	2	0	0	10	-5	50	5	20	-10	10	-50	45	50	41	30	41	30	20	50	50	30	40	10	-11	41	43	10	45	45
296	2	3	2	1	4	108	0	69	43	1	-5	2	-41	-45	-10	6	46	31	21	-10	-4	-20	-5	-40	40	31	45	21	-34	41	24	-30	45	32	-50	42	33	-50	29	41
297	6	4	1	1	4	42	0	50	50	1	22	1	21	-30	-31	-50	31	20	22	-20	-19	-40	0	-20	0	21	0	-50	-50	40	0	-50	31	0	-50	31	0	-40	21	0
298	4	3	2	2	3	50	0	100	50	1	50	2	0	-31	-21	-30	10	10	50	-50	21	-50	20	50	50	50	50	50	0	50	50	50	50	50	0	50	50	50	50	50
299	4	4	2	2	2	73	11	48	8	1	21	2	-45	-42	-43	-41	49	10	10	-41	22	9	-40	19	28	37	20	21	-11	20	22	-11	10	9	-13	9	8	-10	10	9
300	3	3	1	1	3	118	67	20	67	1	25	2	0	25	25	25	12	50	-25	0	0	-12	-25	50	50	50	25	0	0	50	50	15	50	-50	-50	50	50	0	12	37
301	4	3	1	1	4	25	16	36	4	2	-10	2	23	19	10	43	16	49	13	-26	-20	-42	49	3	44	43	5	46	44	4	45	43	4	43	43	7	40	39	11	43
302	6	4	1	1	4	31	0	90	10	1	35	2		-50	-41	10	50	26	20	0	0	-10	-31	46	39	34	0	10	20	0	20	10	50	40	10	50	40	20	30	40
303	5	4	2	2	4	200	50	51	100	1		1		32	38	34	44	22	32	25	23	45	32	30	30	30	30	31	30	10	29	32	14	15	25	37	34	37	23	16
304	5	4	1	1	3	49	3	90	8	1	10	2	0	0	-31	-32	9	10	31	-1	8	-11	0	0	9	0	30	30	-11	40	39	-12	40	40	-11	39	40	-11	29	30
305	3	3	2	2	4	33	1	2	98	1	17	2	-23	21	22	2	20	-24	-10	30	-15	-11	7	29	31	30	-9	18	11	11	-30	6	24	4	3	-14	4	-47	11	5
306	4	4	2	2	3	129	50	50	80	1	20	2		20	-21	30	20	20	-21	10	10	-10	9	-11	10	10	10	10	10	20	20	20	10	20	9	10	10	10	-10	10
307	4	4	1	1	3	49	49	48	90	1	50	1	49	20	9	9	23	21	22	22	7	10	8	49	31	50	46	10	10	27	41	41	48	12	10	21	49	49	48	49
308	4	4	1	1	3	175	4	71	31	1		2		-50	-50	-45	50	50	31	31	49	0	41	20	20	20	20	20	-21	31	30	-20	40	40	-20	41	39	-19	41	41
309	4	3	1	1	4	75	80	20	20	1	40	1	40	40	-40	-10	25	40	40	-10	40	-10	-10	40	40	40	-50	-50	-50	40	40	40	-50	-50	-50	40	40	40	10	41
310	6	8	2	2	4	78	0	78	2	1	48	2	1	0	38	10	35	16	1	16	30	20	-10	9	11	25	-2	-2	-3	3	6	14	-8	-8	-9	7	5	7	8	6
311	3	3	2	2	4	73	9	30	19	1	41	2		10	10	-20	-20	31	10	-10	10	-31	21	11	10	10	10	10	-21	30	31	10	10	10	-11	20	21	12	19	20
312	3	3	1	1	1	40	25	25	50	1	43	2	-1	-21	-34	-31	20	50	50	-50	12	-34	40	30	42	31	50	-25	-25	-27	50	26	50	-34	-50	50	50	50	26	50
313	5	3	1	2	4	22	2	30	17	1	20	2		-49	-50	-48	-11	33	-29	-48	-43	-44	18	35	8	7	39	37	10	-10	21	20	20	21	8	45	36	20	29	40
314	2	2	2	2	4	11	1	49	50	1	26	2		-26	1	-26	2	-38	36	13	18	-49	0	26	-5	29	-40	-40	-50	-36	-37	-50	1	-46	-50	1	-42	-50	42	1
315	4	3	2	2	4	76	70	3	100	1	11	2	11	-21	23	-41	12	13	-39	6	21	-24	48	19	22	-32	15	4	-48	33	33	-47	24	16	-46	26	24	-46	8	46

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
31	9	30	50	10	48	21	1	1	5	20	0	0	1	21	0	4	4	4	4	4	5	5	5	5	30	50	-10	20	-10	-50	10	31	0	-2	-50	0	20	21	9	
40	50	40	40	-10	50	40	50	50	50	50	-10	-50	50	-10	50	-50	40	50	50	-50	50	50	-50	-30	-50	50	0	50	40	-50	20	40	-50	0	30	50	40	-10	50	
21	34	27	22	38	28	24	13	30	22	18	15	15	-8	9	26	-13	-30	8	-7	-7	21	-40	-20	9	15	11	-4	12	-8	6	38	2	6	50	13	30	7	38	23	
5	25	20	10	25	5	5	25	15	0	25	15	5	41	15	10	35	20	15	25	5	15	5	15	20	10	5	-10	-10	10	5	20	10	-5	-5	1	1	5	16	-5	
10	50	40	10	40	30	10	50	50	10	50	0	-50	50	50	30	50	50	50	30	40	0	-20	-40	0	40	40	-20	20	30	0	-20	0	-20	0	-20	-20	0	40	20	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10	50	50	-25	25	50	-20	50	50	-20	50	50	-50	50	50	50	50	50	50	25	50	50	-50	-50	21	-50	50	0	0	0	-50	-50	-50	-50	20	-24	-24	20	50	-50	
28	8	-17	11	10	0	10	-18	-18	27	10	9	8	27	23	20	19	17	16	24	22	21	19	24	17	15	24	9	16	26	10	-10	-12	23	29	-23	-32	35	13	6	
20	50	50	20	50	-10	10	50	50	50	10	20	-10	10	5	10	2	0	30	0	0	15	0	-20	0	0	0	0	5	0	-10	0	30	0	21	0	5	0	25	5	
31	0	20	10	30	-21	0	0	0	0	30	10	0	-11	-11	-10	0	0	30	0	0	-1	0	10	30	0	0	-10	-11	20	-11	20	0	0	0	-30	-20	11	20	0	
50	0	0	0	0	0	0	0	0	0	-50	-50	-50	50	50	50	0	0	-1	5	5	5	0	0	0	0	-10	-10	-10	-10	-10	40	25	40	25	-10	-10	50	50	-40	
50	50	50	50	50	-25	50	50	50	50	50	-50	-50	50	50	50	50	50	50	50	-50	-50	10	10	10	25	-25	-50	50	25	25	40	50	50	50	-10	50	50	50	20	
30	19	38	22	28	-14	50	50	-26	-24	50	-35	19	38	35	27	15	20	50	9	19	50	-18	-16	-9	40	32	25	50	37	-15	44	33	-15	-13	-14	50	33	50	18	
10	1	5	5	5	10	10	5	10	10	5	10	10	5	10	10	-10	5	20	-5	5	10	-1	5	5	-5	-5	-1	-5	10	5	30	5	30	20	30	20	10	10	10	
30	50	41	41	41	41	41	30	50	40	50	4	-10	50	50	50	45	30	45	30	35	41	41	20	0	-41	20	-30	0	30	-11	-41	-31	-41	0	-10	15	-21	10	-31	
0	-29	38	32	9	25	39	32	41	-12	44	19	-33	10	32	20	-10	25	41	-35	29	21	-11	-17	39	20	28	-16	33	19	-24	-25	-20	-39	-13	-41	-26	-30	-22	-28	
-19	10	0	-9	20	0	-21	10	0	-10	10	1	-10	10	0	-9	10	0	-11	10	0	-12	11	0	-9	-11	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
50	50	50	41	50	50	0	50	50	50	50	10	10	50	50	50	50	50	50	10	12	50	21	-50	-41	11	50	10	50	50	-21	50	50	50	50	41	31	-19	50	50	
29	9	9	28	10	9	-10	11	9	-10	11	9	-12	9	10	49	-10	-11	50	-10	-11	50	10	10	-11	30	30	9	3	49	39	43	45	-8	-8	18	30	43	42	35	
0	12	50	0	25	25	0	50	50	50	50	-25	-25	25	25	25	-25	-25	-12	-25	-25	-25	0	12	0	25	50	0	25	25	25	12	25	-25	0	-12	0	25	25	-12	
43	20	34	45	18	42	43	8	21	43	3	43	45	6	4	45	8	28	18	13	12	8	4	10	49	44	41	9	19	48	26	13	24	-8	-13	47	35	42	41	45	
20	50	40	30	-20	10	50	50	50	50	40	20	30	0	10	20	5	0	50	-5	40	50	-10	-30	50	10	20	10	10	10	2	35	25	-30	-10	10	0	30	30	0	
14	20	10	38	15	9	8	23	15	8	9	5	17	6	8	13	10	10	10	10	9	41	17	14	11	8	10	9	9	16	14	6	9	9	9	6	9	14	10	10	
-11	31	31	-11	30	30	-10	29	30	10	30	30	-21	29	29	-12	30	30	30	10	9	-12	-12	-11	9	-11	-12	-11	-10	-30	-33	-11	-11	-11	-12	-11	-11	-11	-11	-10	
-34	28	15	-48	-13	-22	-40	20	14	-32	-17	21	9	10	11	-41	8	35	-48	29	29	-41	49	48	-50	7	2	-34	40	46	-6	3	-48	5	5	5	-23	2	38	34	
10	-10	11	10	9	10	9	9	20	20	20	-10	-11	20	10	20	-10	-11	19	-11	-11	-10	-11	-11	-11	10	10	-10	-11	9	9	9	11	-10	-10	-10	-11	10	10	-10	
49	40	40	41	29	41	29	9	50	38	30	30	41	20	16	35	8	17	27	-50	-50	-50	0	0	0	49	50	7	50	-35	-1	-20	-21	-16	-13	-12	14	41	48	6	
-18	40	40	-12	42	39	-13	41	41	-11	37	41	-14	41	39	-11	38	38	-13	13	9	10	7	8	18	9	13	10	15	8	13	11	12	10	9	11	10	10	11	8	
-40	40	40	-40	50	40	-50	40	50	50	40	20	-20	40	40	40	40	40	40	1	1	1	-40	-20	-20	50	50	1	50	20	1	1	1	-20	-20	-40	40	50	50	-40	
6	2	3	8	3	3	3	1	3	6	-4	-4	-5	1	3	7	8	7	7	4	6	4	2	4	7	23	16	9	18	34	33	34	24	13	14	24	12	9	11	19	
20	20	20	20	20	20	11	21	21	10	20	20	-10	11	11	11	11	10	20	10	10	21	-10	-10	11	20	20	-10	20	20	0	0	10	-10	0	-10	-10	20	20	-10	
9	20	50	12	40	21	11	10	50	50	40	11	5	0	15	50	5	5	50	11	-21	-22	31	-31	-14	41	48	-20	32	50	-10	-21	10	-21	-21	-8	-21	50	50	-19	
22	-6	32	10	7	20	4	37	37	2	20	18	-6	-14	8	11	-27	-13	48	-14	-16	32	8	-17	42	-38	-40	-39	-34	-14	-33	-47	11	-16	7	0	0	19	-30	-10	
-36	50	-39	-47	23	3	-7	33	-15	-48	50	-50	-50	37	-3	-34	5	5	6	9	2	2	-5	-2	-9	-40	4	2	20	33	-4	2	2	-41	-6	-21	-19	-49	-6	29	
-47	37	25	-50	19	22	-42	35	14	-47	31	32	-44	24	36	-47	39	21	-48	26	48	-46	44	44	-48	23	-26	-29	16	15	30	-7	2	15	-15	17	13	-22	14	7	

81	82	83	84	85	86	87
-10	50	32	19	10	50	50
0	40	40	20	20	50	50
20	3	50	29	21	22	25
-15	21	5	30	15	35	20
20	40	40	-25	-25	-25	0
0	0	0	0	0	0	0
50	0	0	0	0	50	10
17	13	7	35	19	35	21
0	40	40	40	40	10	20
0	-12	-13	-9	-13	20	20
-40	50	50	-25	-25	50	50
-50	-50	-50	50	50	40	50
20	42	50	40	43	43	43
3	-10	10	20	20	20	20
0	40	30	30	30	30	50
-18	34	26	14	12	29	32
0	0	0	0	0	0	0
-10	50	50	50	50	50	50
45	50	50	45	42	49	48
12	12	12	25	25	50	50
41	45	40	43	39	45	42
0	50	50	10	10	40	31
9	10	10	10	20	28	15
-11	20	19	0	0	9	9
33	-7	17	12	-13	17	20
-11	10	9	20	20	20	19
5	-12	-11	36	36	50	50
9	13	10	11	13	9	13
40	50	50	-1	-1	50	50
25	10	5	6	34	29	20
-10	20	0	31	30	32	31
-19	29	50	24	26	50	50
-31	16	15	-13	-14	5	7
-9	50	2	8	4	50	10
-41	16	12	2	38	-12	21

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
316	4	4	1	1	4	60	0	20	80	1	0	2		0	0	0	0	30	0	-30	-30	-30	0	0	0	0	0	0	0	0	0	0	-30	-30	-30	0	0	0	0	0
317	3	3	2	2	4	10	0	80	20	1	0	2		0	0	0	0	40	0	-34	-34	-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
318	5	3	2	2	4	50	0	100	50	1	50	2		-50	0	0	30	0	-20	0	10	-50	0	10	30	-50	50	-20	-50	50	50	50	50	-50	-50	50	50	50	50	50
319	2	2	2	3	5	13	0	81	19	1	49	2	0	3	-2	-19	15	22	37	-5	15	16	4	11	24	6	31	22	-50	44	29	7	36	20	-50	37	37	37	40	49
320	3	3	1	1	4	9	20	30	50	1	20	2		0	-31	10	10	36	40	10	21	-10	-10	-30	20	41	20	21	-11	21	21	10	20	21	-10	21	20	10	10	31
321	2	2	1	1	6	48	0	67	33	1	30	2	0	-28	3	-20	10	20	5	0	7	-50	5	32	25	20	50	-5	-10	50	20	-20	50	-50	-50	50	20	-8	24	38
322	3	3	1	1	3	23	9	9	4	2	0	2	0	50	50	21	-11	39	32	31	10	21	-11	19	31	39	20	24	39	12	34	7	9	26	25	18	26	37	15	30
323	4	4	1	1	2	26	39	49	49	1		2	30	29	20	41	30	21	20	19	17	21	13	18	12	10	19	14	19	15	27	19	21	31	14	13	22	12	23	19
324	4	3	2	2	3	52	1	100	10	1	50	2	-1	20	-20	10	21	26	40	-31	10	-41	-24	1	-10	20	10	10	10	10	10	10	10	7	3	21	21	21	1	1
325	5	5	1	1	4	150	0	50	50	1		2		4	4	30	50	50	50	2	1	1	1	-2	-3	50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50
326	4	3	2	2	4	200	50	50	100	1	50	2	0	-50	21	21	50	21	-20	21	50	20	21	42	31	-50	50	50	-50	50	50	-9	50	50	-50	50	50	-11	50	50
327	4	3	2	2	4	163	50	28	28	1	45	2	0	30	40	40	10	0	19	-1	10	9	-11	10	10	11	10	-11	-11	20	-11	-10	19	-13	-11	-10	8	9	29	30
328	3	3	2	2	3	60	2	80	20	1	20	2		0	3	3	5	40	40	30	20	24	-15	-10	30	10	49	30	-50	40	50	2	50	41	-50	50	50	-10	31	50
329	2	2	1	3	4	175	12	100	48	1	19	2	0	-50	-50	37	50	50	21	-32	15	-26	-50	0	26	13	49	-42	-50	50	-50	-50	20	-50	-50	31	-50	-50	30	-50
330	3	2	1	2	4	160	9	60	29	1	20	2		-50	0	10	-10	20	40	-20	-20	-50	-50	30	50	50	50	0	-38	50	40	-1	50	30	-50	50	50	-20	50	50
331	2	2	1	1	2	20	0	6	6	1	7	2		-10	9	9	13	15	27	19	15	-7	-6	35	31	23	41	29	9	50	41	22	50	31	5	50	38	19	50	28
332	2	2	1	1	5	40	10	75	25	1	50	1	50	-20	20	-30	50	20	50	0	30	-50	-10	-50	35	50	50	50	-50	50	50	-50	50	50	50	50	50	-50	50	50
333	3	3	2	1	3	34	40	30	8	1	15	2	-3	3	-33	-27	25	-12	50	16	30	10	1	2	22	33	-50	-50	-50	-49	-47	-50	-50	-50	-50	10	13	-29	4	38
334	4	3	1	1	2	103	0	80	30	1	50	2	-50	-50	-50	-50	-50	-50	-50	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335	4	5	1	1	1	8	2	1	49	2	19	2		-9	-29	10	-13	38	15	9	18	-12	5	-25	25	-27	-50	50	-50	21	42	-50	21	34	-50	50	50	-30	9	36
336	4	4	2	2	3	33	0	9	4	1	2	1	11	14	10	13	23	16	3	6	9	7	6	7	18	9	9	22	9	7	13	8	17	15	19	9	16	15	9	10
337	4	3	1	1	2	22	5	12	2	2	7	2	5	7	10	14	6	5	6	11	3	7	0	1	3	3	3	3	4	3	1	4	5	6	6	5	3	7	4	6
338	4	3	1	1	3	37	2	12	1	2	2	2	5	7	6	4	8	6	3	6	9	5	5	8	6	6	7	6	3	5	9	6	5	11	7	9	10	9	8	8
339	3	3	1	1	3	96	0	35	29	1	15	2		-20	-21	5	10	10	50	15	35	-50	-10	-20	10	20	30	-50	-50	50	21	-21	50	-21	-50	50	21	-31	20	25
340	6	4	1	1	4	75	49	29	31	1	22	1	24	20	21	20	20	22	20	12	9	13	12	10	9	19	10	11	12	10	9	10	7	13	12	10	14	11	11	10
341	2	3	1	1	3	178	44	73	100	1	36	1	-35	-28	-43	30	37	43	44	-37	38	-30	43	27	-40	12	24	4	-13	32	-24	31	30	-18	28	-20	-32	-16	-18	33
342	5	4	1	1	3	35	1	20	6	1	9	1	10	11	12	12	12	12	14	16	15	16	15	5	8	11	9	13	14	6	9	13	9	9	12	10	12	12	12	12
343	4	3	1	1	4	24	9	2	9	1	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	
344	3	2	2	2	2	200	39	100	19	1	50	2	-10	-10	50	50	50	50	15	50	50	25	25	20	10	48	-50	-50	-50	50	50	50	-12	6	1	19	13	25	50	50
345	4	3	1	1	3	150	19	81	20	1	41	2	0	0	0	41	15	50	50	-11	31	0	-50	0	11	30	20	20	20	30	30	21	21	21	21	40	30	31	32	40
346	5	5	1	1	3	100	0	100	32	1	20	2	0	-25	-25	25	35	35	-25	-25	-25	0	-25	-50	-50	-15	50	-50	-50	50	50	15	50	-25	-50	50	40	-15	35	25
347	4	4	1	1	3	50	0	75	43	1	19	2		-27	0	0	32	0	0	1	20	2	0	0	0	25	25	25	25	25	25	25	27	25	29	26	27	27	25	26
348	3	4	2	2	4	77	4	70	90	1	40	2		1	0	0	41	0	41	0	0	0	0	10	21	41	0	0	0	10	10	9	0	0	0	10	10	10	0	0
349	5	5	1	1	3	50	3	83	30	1	15	2	-5	4	10	10	30	20	10	20	19	36	10	-5	6	7	5	8	11	5	14	20	6	10	15	6	13	19	10	11
350	6	4	1	1	3	74	9	40	61	1	30	2		-31	-10	-11	10	0	30	-20	7	-10	20	10	11	21	41	50	10	9	50	11	41	50	15	10	50	25	20	50

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	50	50	50	50	40	40	50	50	50	50	-50	-50	50	50	50	0	50	50	0	50	50	-20	-50	20	-50	-50	-50	-50	10	0	-50	-50	-50	0	0	0	0	-50	-20
6	24	28	2	-6	31	-42	33	27	26	35	8	-50	4	40	38	40	42	44	7	32	49	38	15	27	-4	4	-14	-16	15	11	13	14	-17	15	-10	11	40	38	30
21	31	26	11	20	50	21	21	21	11	31	20	-21	20	26	15	21	41	31	11	31	31	-20	-31	10	-20	-26	-10	20	20	-31	21	21	25	31	5	20	41	-5	31
15	50	10	1	-10	36	20	50	20	-11	50	-50	-50	31	20	20	5	5	10	-10	10	20	10	-10	-10	10	40	-10	8	40	12	30	50	-10	10	15	0	10	31	-10
21	31	26	22	18	33	25	15	23	26	15	19	28	20	29	28	20	18	11	11	24	25	16	22	16	20	20	16	37	30	28	29	28	24	24	41	29	26	27	22
33	16	18	35	25	15	31	15	17	22	15	19	23	19	27	25	14	27	24	15	30	34	22	12	31	13	19	25	27	26	28	37	17	28	18	34	20	30	40	15
1	1	1	1	10	10	10	10	10	10	-1	-1	-1	2	2	2	1	10	30	2	26	50	2	10	20	45	45	25	40	50	29	50	50	50	41	26	25	50	36	43
50	-50	-50	50	-50	-50	50	-50	-50	-50	-50	-50	-50	-50	-50	50	-50	-50	50	-50	-50	-50	20	-50	-50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	-11
20	50	50	21	50	50	31	50	50	30	50	50	-50	50	50	50	50	50	50	50	50	50	-50	-9	50	50	50	-50	50	50	-30	-50	50	-50	31	0	0	50	50	-30
31	20	20	22	20	20	20	18	21	21	50	49	49	49	49	49	48	49	50	11	12	12	-9	-10	-11	49	50	39	40	30	29	9	10	9	9	30	29	-10	-10	5
11	50	50	2	50	20	0	50	50	10	50	31	-41	50	50	-10	-50	-50	10	21	41	41	30	-11	50	20	20	-42	-41	20	11	-10	-10	-40	-41	-10	-31	31	20	13
-50	14	-34	-50	-37	50	0	50	-11	-23	50	-50	-50	-50	-50	-50	0	0	0	-35	28	40	15	-22	20	-32	23	-33	35	-50	-50	-50	-50	-50	-50	0	0	-35	50	0
-50	50	50	30	50	50	10	50	50	0	50	40	-40	50	50	50	50	50	50	50	50	50	-35	-36	36	50	50	40	30	40	21	30	28	20	29	25	27	28	32	24
15	50	30	16	21	15	10	30	24	15	50	28	8	34	28	16	13	45	19	34	25	16	2	15	24	16	24	20	15	23	22	28	-10	-8	8	-10	10	-13	18	23
10	50	50	50	50	50	21	50	50	-50	50	50	-50	50	50	50	50	50	50	-50	20	50	3	10	10	50	50	-10	-10	20	50	50	50	50	50	-10	10	10	10	11
50	36	50	35	-16	15	50	15	48	-20	26	42	-16	3	27	26	11	39	50	5	49	31	27	12	34	10	11	15	-30	-23	40	20	50	-17	-17	-1	-1	16	7	14
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	30	0	0	0	0	0	30	0	0	0	30	0	30	0	30	0	0	0	30	0
-38	35	50	-50	30	41	-50	36	46	-50	39	40	-50	33	34	-50	28	34	-35	13	13	-40	-31	-39	50	-28	-28	-20	-24	-33	-33	-28	-30	-50	-23	-40	10	-6	-15	-15
9	10	12	13	7	9	9	13	14	5	11	11	10	12	19	7	8	6	2	14	12	8	16	15	4	7	21	10	13	13	13	25	24	29	14	7	5	18	20	16
5	5	5	9	4	6	8	5	6	5	3	2	5	5	5	3	4	3	4	6	7	7	5	0	0	15	10	12	5	6	5	6	8	8	9	11	10	9	7	10
12	7	9	11	6	6	8	7	10	10	7	10	14	3	7	9	7	9	9	6	10	16	7	10	12	5	9	10	6	14	12	2	3	8	5	6	7	6	8	9
-20	50	31	-21	-31	30	10	31	31	31	50	-30	-50	50	30	15	-50	-10	50	20	10	30	50	-20	-18	25	30	10	10	10	20	-30	20	-20	20	-10	20	-10	30	30
13	11	11	14	11	11	14	11	12	10	12	13	10	14	14	11	13	13	13	11	10	9	12	11	11	15	17	14	15	15	12	13	16	14	12	12	11	15	12	13
33	30	-19	28	-17	37	-16	14	38	-20	35	8	-7	34	27	-30	-32	26	-18	-22	22	-16	-13	31	-18	-32	22	-3	27	-18	32	25	30	-24	33	-14	33	28	-15	-16
13	7	7	10	16	15	19	13	15	20	6	10	11	12	10	18	13	14	17	12	11	16	12	11	16	12	12	15	11	15	8	20	20	30	31	13	12	12	13	19
0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	-1	1	-1	0	0	0	0	0	0	0	0	0
50	50	25	50	50	24	18	2	10	50	-5	-14	50	7	10	50	10	22	50	31	14	50	31	19	50	50	50	9	13	50	50	10	50	6	50	-15	26	40	15	33
10	36	35	14	37	37	11	32	32	24	33	34	0	46	26	36	45	0	35	36	0	25	0	35	6	31	50	10	40	46	0	10	0	-21	0	0	20	25	40	30
-35	50	25	-50	50	-35	-35	50	35	-35	50	-50	-50	25	25	25	25	25	50	-25	-25	25	25	25	25	25	25	-25	-25	-15	-15	-15	-15	-25	-25	-35	-35	-25	-25	-35
26	27	27	27	25	25	25	25	25	26	40	36	36	0	25	27	8	28	28	5	25	25	25	25	25	27	27	-17	26	0	28	0	26	0	27	0	25	0	23	0
0	0	0	0	0	0	0	10	9	11	0	0	0	0	0	1	10	10	10	0	0	0	-10	-11	-11	31	31	1	3	0	0	5	0	1	0	0	0	3	4	0
17	6	13	20	8	16	21	5	14	22	3	14	20	4	11	16	4	17	27	5	15	20	5	9	14	28	28	30	27	23	21	27	23	19	19	31	24	21	27	22
16	10	50	16	41	50	15	10	50	50	50	50	10	10	50	36	5	37	50	5	35	50	41	-16	-4	50	50	20	20	20	-5	5	26	20	50	20	6	50	50	-11

81	82	83	84	85	86	87
0	0	0	0	0	20	20
0	0	0	0	0	0	0
-50	50	-50	20	20	50	50
-8	46	47	46	46	44	47
26	41	41	10	5	50	50
6	50	20	50	50	50	50
28	24	24	-14	15	-20	21
33	21	29	26	34	21	30
1	50	1	50	27	50	-20
-11	50	50	-11	-10	50	50
21	50	50	50	50	50	50
3	40	41	20	20	29	29
-41	1	50	50	0	31	31
32	50	0	-50	-50	50	50
38	33	34	25	30	28	29
-7	31	31	8	8	37	39
22	21	50	50	50	50	50
23	49	47	45	36	41	40
30	0	30	0	30	0	30
-11	-15	-13	-24	-34	-8	-4
14	15	27	14	19	13	23
11	7	15	12	12	13	11
5	5	4	12	11	10	10
30	-10	-35	10	10	50	30
12	11	11	12	11	12	13
20	20	-11	-8	30	26	-33
21	22	20	21	17	14	15
0	0	0	0	0	0	0
50	11	13	31	43	22	24
0	50	50	40	40	0	50
-35	0	0	0	0	15	15
25	45	45	28	28	0	27
0	20	20	20	10	3	39
25	23	20	25	24	26	30
14	30	31	30	31	31	36

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
351	2	3	1	1	3	100	50	19	50	1	50	2		20	20	-20	30	30	50	0	20	-20	50	20	30	50	-30	20	20	20	-21	-20	31	-30	-30	31	-31	-31	19	21	
352	4	4	2	2	2	100	91	9	91	1		2		-20	-31	-30	-20	-19	20	-20	10	-21	10	10	20	20	10	10	-41	20	20	-31	-30	-10	-41	-20	-21	-20	10	10	
353	2	3	1	1	2	95	51	21	73	1	22	2		26	22	26	17	21	19	20	32	20	19	20	6	26	18	20	19	22	21	25	19	20	20	18	23	18	22	24	
354	5	5	1	1	5	198	98	97	97	1	43	1	42	44	43	44	40	40	38	35	38	40	47	40	41	41	42	41	41	40	41	41	41	41	44	42	41	40	40	41	
355	3	3	1	1	1	4	0	2	2	1	41	2	30	-30	-21	18	10	41	-10	-20	10	-30	-10	-20	30	21	-21	40	-30	31	10	10	10	41	-41	41	10	10	10	30	
356	2	2	1	1	2	12	5	6	10	1	32	2		-4	-50	50	26	50	50	50	32	8	-50	15	14	36	50	-50	-19	50	50	50	-50	-50	-50	50	50	50	50	50	
357	5	3	2	2	3	10	80	5	15	1	30	2		-31	30	20	10	50	50	-31	30	25	20	-31	-21	-11	-50	50	-20	30	50	10	30	50	-21	50	50	30	19	50	
358	2	2	2	2	1	51	0	78	22	2	50	2	0	-31	9	-11	11	0	9	-43	17	-23	-10	10	46	11	50	-25	-50	22	27	-50	49	-50	-50	50	50	-50	18	50	
359	5	3	2	2	4	100	9	9	25	1	50	2		-50	-50	-50	50	50	-50	-50	-50	-50	-50	10	30	30	20	41	10	21	41	10	50	50	10	41	40	10	20	41	
360	4	3	1	1	3	12	1	100	50	1		2		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	2	1	1	
361	3	2	1	2	1	10	0	2	1	1	3	2		1	2	-29	6	14	16	7	4	3	50	0	0	12	2	5	-37	37	5	43	-2	7	-44	31	17	43	16	23	
362	6	3	2	2	6	156	0	90	49	1	41	2	0	-50	-50	10	40	50	50	0	50	40	0	0	0	50	50	0	-2	50	0	0	50	0	0	50	0	0	50	0	
363	5	4	1	1	5	12	3	80	15	1		2		-40	-41	21	-40	30	10	21	10	18	-21	-30	31	-10	21	41	-20	21	50	10	31	31	31	31	31	30	-20	50	
364	7	5	1	1	4	98	3	5	19	1	19	2	-18	-7	9	3	30	20	15	-6	-4	-10	-9	46	25	4	9	46	-16	48	39	4	46	-4	-4	46	5	-5	47	24	
365	5	8	2	2	3	81	19	19	30	1	21	2		21	-11	31	10	20	46	-10	-10	-20	-20	30	20	20	41	20	-10	50	20	20	41	20	-20	50	29	20	40	21	
366	6	8	1	1	3	13	4	100	0	2		2		8	20	9	9	40	-21	20	11	-10	-10	32	30	50	19	19	30	15	15	42	23	22	-17	20	21	20	20	20	
367	5	4	1	1	4	50	1	20	60	1	20	2		10	25	25	25	10	30	9	41	-20	10	9	40	40	10	41	10	25	25	25	40	30	40	40	30	41	20	41	
368	4	8	1	1	4	25	0	100	5	1	20	2		26	-50	16	10	30	0	20	20	-10	0	30	20	20	30	10	0	50	25	26	30	-10	-10	30	15	16	31	30	
369	3	7	1	1	4	30	0	70	30	1	20	2	0	20	10	-20	20	20	20	0	0	-10	0	-20	10	20	-20	0	0	-20	20	30	10	0	0	-10	10	10	-20	20	
370	4	3	2	2	3	10	0	2	8	1	0	2		0	0	0	0	0	0	30	30	20	30	0	0	20	50	-50	-50	28	12	0	50	0	0	31	0	0	30	11	
371	6	5	2	2	3	99	40	29	80	1	46	2		-50	-48	-30	40	-11	41	-41	-32	-41	0	-11	41	-21	0	41	0	10	49	30	0	10	-41	10	10	0	10	10	
372	3	3	2	2	4	34	0	100	80	1	-40	2		-50	-50	-30	20	40	-19	-50	-19	-50	30	45	19	-19	42	42	-19	50	50	20	50	40	-50	50	50	-50	50	50	
373	5	5	2	1	3	30	20	50	75	1	50	2		-10	50	-50	25	50	10	-25	25	-35	50	25	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
374	4	3	2	2	3	100	15	100	15	1	31	2	30	31	41	31	42	50	50	0	50	20	-31	0	1	31	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0
375	3	3	1	1	3	64	9	70	28	1	0	2	0	-50	-50	0	50	0	30	-1	-1	-42	0	0	20	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
376	3	3	2	2	3	61	0	100	10	1	50	2		-50	-50	-25	25	-31	-30	-10	15	-50	-50	50	20	41	50	50	50	50	50	50	50	50	50	20	50	50	40	50	50
377	3	3	1	1	2	8	11	19	23	2	-14	2	-2	-7	-4	3	3	3	34	34	28	9	11	-11	-11	12	-28	-27	-28	-18	-19	-20	-7	-11	-1	3	3	4	3	-5	
378	3	2	1	2	3	2	0	10	90	1	40	2		-50	-50	-50	-10	10	20	-50	10	-50	10	50	10	10	50	50	2	50	50	0	50	50	0	50	50	1	11	50	
379	5	4	1	1	4	90	0	90	8	1	25	2	0	0	0	0	40	0	9	0	0	0	-21	50	0	50	40	40	40	50	50	9	30	30	-11	50	50	20	50	50	
380	4	3	1	2	4	2	0	4	91	1	20	2	0	0	-50	-21	-20	50	50	-11	20	0	11	20	31	41	40	50	-20	50	30	30	50	50	-21	50	50	0	20	50	
381	3	3	2	2	3	48	9	50	50	1	41	2	-42	-30	10	-20	20	21	-10	20	31	-10	10	10	10	11	11	10	-11	11	20	-10	20	30	-31	11	10	-22	20	31	
382	3	3	1	1	1	150	0	30	70	1	1	2	0	1	-1	20	30	50	10	-1	-1	-1	1	20	40	50	10	10	50	50	0	0	0	0	0	50	0	0	0	30	
383	5	3	2	2	4	5	8	90	3	1	40	2		-41	-50	-50	21	50	21	-21	0	-11	-11	-31	10	10	30	-50	-20	31	41	41	48	-47	20	50	41	41	30	50	
384	4	4	2	2	3	36	100	5	100	1	30	2	0	0	-50	0	25	0	14	0	8	-20	49	0	0	1	0	0	-31	22	30	-34	18	10	-47	23	25	-38	24	27	
385	6	8	2	2	4	10	50	20	3	1	31	2		-11	-20	-10	20	20	21	10	20	20	10	41	10	21	20	10	-10	31	41	30	41	10	4	50	50	31	41	30	

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
20	21	20	20	-20	50	50	-20	50	50	20	-50	-50	21	21	28	21	50	50	-9	-11	-12	-32	-23	-17	-30	-50	-50	50	50	30	31	50	50	50	50	50	50	50	-31	
-30	-20	-21	-31	-20	-21	-41	10	10	-30	-20	-20	-20	10	10	-10	-20	-21	-21	20	20	-20	21	20	-10	41	41	21	20	41	41	41	41	20	20	10	10	21	11	20	
14	20	22	20	17	17	3	23	17	15	16	14	10	15	14	11	17	14	-6	20	10	-8	16	13	20	15	15	10	11	6	11	9	17	6	6	9	9	5	13	19	
40	40	42	39	40	40	40	40	41	40	39	40	41	40	40	39	41	41	39	39	40	40	40	38	39	39	38	39	41	40	39	41	40	41	40	40	39	40	38	40	
-21	10	41	-20	10	10	-11	40	20	10	20	31	-30	10	40	-10	20	31	10	40	-10	20	31	-21	-21	10	10	-10	-10	10	-11	-20	-20	-31	-10	10	-20	10	-10	-10	
50	50	50	50	23	23	32	26	25	31	50	-8	-9	46	46	39	-50	13	50	-50	-32	20	0	24	34	48	50	12	12	50	30	50	39	11	13	11	35	33	34	50	
-50	50	50	-41	50	-20	-40	-21	50	9	9	50	-20	50	50	20	50	30	41	50	9	40	40	-50	-10	-10	20	-10	5	30	-20	-41	-40	-40	5	-50	-20	-41	10	-30	
8	50	22	9	16	50	17	50	50	16	50	-50	-50	50	-50	50	50	-50	50	50	-50	50	-29	-50	-19	7	14	-29	17	9	41	-29	13	-38	0	17	10	0	17	-21	
21	21	41	11	21	20	11	20	41	10	-21	-20	-20	21	31	50	10	11	11	-10	-10	-10	-10	-11	-11	-10	-10	-10	-10	-10	11	10	11	-10	-10	-10	-10	11	10	-20	
2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	2	2	2	2	2	2	
9	0	0	0	0	19	25	2	40	3	17	2	-11	-1	3	-32	10	24	16	9	31	-3	7	41	1	7	31	2	8	6	14	13	0	-24	-17	-31	14	40	40	32	
50	50	0	0	50	0	0	50	0	0	50	0	-2	50	0	0	0	0	50	0	-2	50	0	0	50	50	50	10	10	0	50	50	49	20	-42	-11	-11	-50	0	0	
-20	20	50	-9	49	30	-10	-21	50	-19	41	31	-9	-29	20	21	-30	11	31	-9	-10	10	-20	-11	21	-20	-10	11	10	-10	-30	-31	-27	-29	-30	-30	-31	10	9	-9	
-11	36	35	-10	25	26	-9	35	35	-4	20	21	-9	41	25	46	1	0	-1	0	0	0	0	0	0	9	-11	-9	30	16	-15	0	-19	0	-19	-12	-14	10	0	-8	
-1	41	30	20	41	-11	-11	31	31	31	50	-20	-21	50	50	50	21	21	21	50	-10	30	-31	20	20	11	30	0	11	20	10	31	11	20	10	0	0	20	10	-10	
30	10	10	-10	21	21	-17	-6	17	-20	26	29	-17	18	19	41	13	14	42	18	19	38	19	20	20	19	18	20	18	29	16	23	25	18	41	19	22	30	24	17	
41	41	41	40	41	11	10	10	50	50	50	11	30	10	31	31	-10	20	20	-41	-10	-10	-31	-21	-20	40	31	-21	41	30	-21	40	-21	-21	-20	-31	-10	10	11	30	
30	35	20	20	50	-10	-10	30	31	30	41	-10	-10	0	0	0	20	20	20	0	0	0	0	0	0	-11	10	-30	10	10	-10	-10	-10	-31	-30	-41	0	0	10	0	
20	-10	10	0	20	-10	0	-20	20	20	10	-10	-10	-20	20	10	-10	0	0	-20	0	20	20	-30	0	20	10	0	10	20	-20	-20	-20	-20	-20	-20	10	30	20	-20	
10	36	0	0	31	0	0	20	10	10	50	-30	-9	41	9	30	30	10	41	30	0	30	-31	20	10	10	20	-50	-50	30	0	0	0	-11	-11	-21	0	10	10	-11	
9	10	10	9	0	10	0	10	9	10	20	21	-21	-41	20	50	-50	10	49	-50	19	49	0	0	0	-11	-50	-10	10	50	-50	10	10	-10	0	0	10	50	31	50	
-30	50	50	-40	50	32	-50	50	50	19	50	40	-50	50	50	-30	29	30	50	11	21	50	-50	-30	20	-31	-32	-50	-50	10	10	20	20	-19	0	-50	-21	31	31	-30	
50	50	50	50	50	50	50	50	50	50	50	20	20	50	50	50	1	20	50	10	10	10	-31	-41	-50	50	30	10	10	10	10	0	0	0	0	50	50	25	25	0	
29	0	0	32	0	0	25	0	0	29	0	0	19	0	0	19	11	0	-1	0	0	0	0	0	-31	20	25	21	10	18	16	21	18	25	25	27	17	23	25	11	
30	0	20	30	0	30	30	0	0	0	0	0	0	0	0	0	0	0	-1	50	20	30	50	20	20	0	0	10	0	0	-31	20	0	0	10	0	0	10	-10	0	
-31	50	50	20	50	-50	20	50	50	50	50	10	50	25	-50	20	41	-31	50	50	-50	50	50	50	-31	-50	50	-50	50	25	-50	-50	35	-50	-50	20	20	-50	31	-50	
2	2	-2	3	3	-4	3	2	-3	3	3	-3	3	-4	2	-2	2	-2	2	3	3	-5	3	4	2	2	4	2	3	2	2	2	2	2	2	-2	5	5	3	4	3
10	40	50	0	50	-20	0	50	50	0	50	-21	0	-2	0	0	0	1	0	0	0	0	10	-1	0	10	30	0	0	0	-30	-50	-50	-50	-50	0	0	0	0	11	
50	50	50	-11	20	20	50	50	50	9	40	40	-11	-11	-11	-11	9	10	41	10	9	50	40	9	20	0	0	20	20	0	0	-11	-11	-11	0	0	-11	0	0	0	
20	30	41	20	19	40	9	29	41	30	41	49	-20	31	41	10	20	20	30	-1	31	41	30	41	19	-31	0	41	0	-20	-21	-32	-21	0	-31	-22	-20	20	10	0	
-21	19	21	-19	40	20	-22	21	21	-19	32	30	-30	31	30	-29	20	-21	-21	30	20	21	-14	26	18	10	21	-21	-20	30	20	20	20	-10	21	12	20	21	20	31	
30	0	40	40	0	20	50	0	0	0	0	0	0	0	10	10	0	10	10	0	0	0	0	-10	-10	20	20	-10	-10	-10	-10	0	10	-50	-40	-30	-20	20	20	20	
0	49	38	0	9	-20	0	24	48	48	50	-20	-20	2	19	5	1	30	30	5	30	30	20	-40	10	-10	10	-31	20	11	-10	-35	-37	-35	-35	-10	10	11	10	-19	
-29	25	26	-43	25	27	-42	26	28	-38	43	43	-49	43	42	-46	0	0	27	35	36	27	0	0	35	0	0	0	-15	-19	-25	31	30	0	0	-38	-40	0	0	-22	
-10	50	30	11	40	30	-10	50	50	20	50	10	-10	30	23	10	40	20	21	40	40	47	-41	9	45	-21	-21	-10	12	-11	31	-12	11	-10	-21	-19	-10	20	23	10	

81	82	83	84	85	86	87
-32	50	50	50	50	50	50
41	41	41	20	20	21	10
11	18	12	10	15	6	16
39	40	40	42	38	39	38
20	31	31	20	20	20	20
49	50	49	49	40	44	26
5	50	50	40	40	41	40
8	50	50	50	50	50	50
-21	11	-10	-10	-10	20	21
2	2	2	2	2	2	2
2	34	28	30	28	26	18
0	0	-3	0	0	-2	1
-20	-10	-10	10	10	-12	-11
-10	-11	-11	0	0	23	15
-10	30	30	40	30	20	21
21	15	16	29	23	21	20
11	10	10	10	9	-10	30
-10	6	0	-50	-50	10	10
10	20	20	10	10	30	30
10	20	-41	0	0	20	0
-50	-41	-50	29	29	50	20
0	20	20	-50	-50	9	9
0	50	50	10	10	50	50
19	24	25	30	20	14	24
10	-11	0	20	10	-11	0
-50	50	50	50	50	50	50
-3	-4	4	3	-5	3	-3
11	50	0	31	31	30	30
-11	0	0	20	0	0	0
0	50	50	40	41	50	50
31	50	50	20	31	21	21
20	-11	-10	-11	-11	10	10
10	0	0	41	40	40	40
-26	21	10	10	17	9	6
29	41	-10	-10	9	10	10

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
386	4	3	1	1	3	48	2	10	30	1	-4	2	-31	-11	-9	15	11	15	41	-19	20	-20	-50	-4	-2	11	4	-5	5	5	-5	7	-3	3	-3	6	-3	4	-4	7
387	5	3	1	1	3	1	2	9	3	1	20	2		41	-21	-30	-20	50	30	30	50	25	40	30	50	-40	40	20	20	50	40	50	40	40	40	50	40	50	30	50
388	3	3	1	1	2	15	0	8	6	1	50	2	0	-34	-34	-37	-10	22	50	19	12	18	50	50	10	10	37	15	-50	43	50	3	49	50	-50	50	50	-21	7	50
389	3	3	1	1	3	0	0	0	0	1	10	2		-11	-6	10	11	20	10	-10	-11	-21	-10	-5	8	4	-8	10	1	50	22	4	5	11	2	50	21	2	10	50
390	3	2	1	1	2	74	2	40	20	1	50	1	31	-50	-31	-27	-28	-26	-26	-21	-11	-21	-22	-15	-13	-7	-5	-4	-3	-11	-4	3	4	-3	8	5	-4	2	2	-3
391	3	3	1	2	3	29	4	72	37	1	38	2	0	3	-13	-11	-8	15	27	3	23	34	-9	10	8	8	5	7	10	18	10	10	17	11	6	16	5	5	13	6
392	4	3	1	1	4	2	1	2	2	1	9	2	0	4	4	9	21	2	20	10	9	-10	0	0	6	6	-10	-10	-10	29	29	30	-19	-31	-48	30	7	7	20	-9
393	3	3	2	2	3	90	29	78	100	1	50	2		5	-7	23	19	30	21	0	14	-18	-28	30	16	43	-17	15	37	-11	14	31	28	28	28	35	26	41	10	20
394	2	2	2	2	1	75	0	50	40	1	11	2	0	0	31	10	20	50	31	32	30	-30	0	50	11	12	50	0	0	50	32	0	50	0	0	50	31	1	50	10
395	5	3	1	1	3	3	0	50	10	1	20	2	0	30	0	0	0	30	30	0	20	0	0	30	30	30	10	30	30	30	30	30	30	30	31	30	30	30	30	30
396	3	2	1	1	3	78	41	41	41	1	22	1	19	17	9	10	10	10	10	11	8	13	4	24	21	21	23	22	22	28	26	26	23	23	23	24	24	24	24	22
397	2	2	2	2	2	50	91	19	18	1	29	1	22	-11	19	10	20	22	19	20	21	12	10	10	22	43	20	20	31	20	22	31	21	28	32	23	22	30	29	33
398	2	2	2	2	3	200	0	50	51	1	0	2	2	-50	0	0	0	0	10	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
399	5	3	1	1	3	42	9	81	9	1	20	2		10	10	10	10	10	10	50	0	20	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	6	6	2	2	4	7	0	1	7	2	0	2	0	0	0	5	2	20	5	4	20	11	-4	25	30	20	20	20	10	41	30	20	20	11	5	41	30	20	35	26
401	3	3	2	2	1	25	0	30	70	1	45	2		-10	-31	10	40	-10	5	10	10	-10	-30	40	40	40	30	30	30	30	40	30	40	40	20	40	40	40	40	40
402	3	3	2	2	4	184	19	71	24	1	30	1	39	31	10	16	20	35	10	40	30	30	-27	9	19	26	9	9	9	11	5	20	6	6	6	5	8	10	7	6
403	3	3	2	2	4	49	9	100	91	1	20	2		-50	-50	-50	20	-50	50	-50	50	-11	-23	-12	13	16	50	-50	-50	9	-50	-50	50	-50	-50	29	-50	-50	49	-50
404	3	3	1	1	4	100	50	50	100	1	-10	2	50	30	20	21	50	21	31	50	10	20	21	20	21	50	0	21	50	20	30	50	20	31	50	20	31	40	20	31
405	4	8	1	1	4	20	0	8	8	1	20	2		-50	31	-20	30	10	41	-21	20	-20	20	21	50	20	30	-20	-20	31	50	30	21	-10	-41	50	41	21	10	50
406	3	2	2	2	5	58	0	24	6	1	50	2	0	0	21	0	31	30	0	20	30	0	0	0	20	30	0	0	0	20	30	0	0	0	0	10	19	23	10	20
407	5	4	2	2	6	125	0	50	20	1	40	2		-50	-50	-50	50	49	24	-40	13	-46	33	50	50	26	48	48	8	49	48	8	47	47	9	47	47	11	43	50
408	3	2	2	2	4	153	8	20	20	1	10	2	-50	-50	-50	9	-22	-22	20	-41	9	0	-50	40	30	20	-19	30	12	49	20	20	20	20	10	50	21	20	44	35
409	3	3	1	2	5	22	1	28	9	1	-23	2		9	11	6	27	-10	50	0	17	0	0	10	29	20	10	-50	-50	50	-7	-26	12	-50	-50	50	-13	-50	14	35
410	2	2	1	1	1	74	9	9	19	1	30	2	10	-11	10	10	20	10	50	25	20	30	15	10	20	50	10	30	10	50	30	10	50	30	15	50	30	15	50	50
411	6	5	1	1	4	75	0	70	0	1	31	2	0	0	0	0	0	0	20	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	10	10
412	3	3	1	1	5	24	7	61	56	1	50	2	0	0	0	0	13	0	39	5	42	-1	0	49	48	48	50	50	49	50	50	50	49	0	0	50	49	50	50	50
413	5	4	1	1	4	83	0	0	67	1	26	2	-10	20	33	1	-11	40	10	1	31	45	0	50	29	9	11	-14	-22	30	24	22	33	-37	-33	12	22	-31	18	33
414	3	3	1	2	4	90	0	50	20	1	30	2	0	-41	-41	-41	20	10	0	5	10	-20	0	40	40	40	40	20	-50	40	40	20	40	30	-20	40	40	40	30	40
415	4	3	1	1	4	100	10	50	9	1	30	2		-41	-50	20	-50	10	40	-20	20	-41	10	-20	-20	-50	30	29	-39	10	10	-30	50	30	-40	50	30	-41	50	30
416	3	2	2	2	2	8	1	4	2	2		2		-11	-10	4	28	-10	49	-22	17	-14	-7	10	5	10	-10	-10	-10	10	10	10	-10	-10	-11	11	9	11	-10	-8
417	3	2	2	2	4	23	0	70	30	1	20	2	0	0	10	0	10	10	31	21	21	-21	21	20	20	11	20	11	-30	31	21	10	21	11	-31	30	21	0	21	40
418	5	3	2	2	4	156	70	29	70	1	40	2	0	0	0	0	50	50	0	-1	30	0	0	0	0	50	50	0	0	50	50	0	50	0	-50	50	0	-50	49	50
419	3	3	2	2	5	87	48	88	81	1	24	1	14	24	18	15	34	22	16	21	16	15	16	0	45	50	33	29	50	39	34	48	43	45	49	49	44	43	28	42
420	4	4	1	1	2	1	0	2	0	1	9	2		0	0	0	1	9	9	-11	-11	0	0	4	24	31	3	7	7	20	20	20	20	10	0	20	19	20	4	26

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
-3	7	-3	11	-5	4	4	5	-4	7	6	-5	3	-2	-1	-2	-2	-2	-2	-2	-5	-1	-2	-1	-1	21	18	-31	-30	50	47	50	50	50	50	50	50	50	50	19	17
10	30	40	40	40	40	40	40	50	40	50	40	30	20	50	40	19	50	50	10	30	50	50	-50	-9	-40	10	-20	-30	40	-30	-20	-30	-40	-40	-1	-1	-40	40	50	
-46	50	50	-30	50	50	-17	49	49	-50	49	49	12	49	49	48	15	15	49	-26	-26	49	27	27	49	8	-29	37	31	12	21	23	47	-16	43	30	8	0	15	2	
5	50	25	3	50	35	8	50	32	5	50	10	1	21	21	1	41	34	50	23	31	50	50	3	32	28	0	-29	-20	14	50	19	0	0	0	-8	-9	32	16	0	
1	1	1	2	-3	5	-2	4	3	3	-4	3	2	4	-2	2	2	-4	4	-2	2	-1	2	-3	1	40	22	13	8	18	29	-27	5	-6	5	-16	14	-8	3	-5	
5	7	8	9	16	11	7	7	5	5	5	7	8	6	8	6	12	7	3	11	12	13	14	19	8	9	12	14	12	17	15	14	14	18	9	13	11	12	18	10	
5	41	29	3	40	27	3	30	31	5	40	6	-7	30	31	5	30	20	11	11	9	9	6	14	21	-31	-30	-11	6	11	-10	-10	-10	-16	-10	-10	0	0	6	-41	
30	10	20	21	4	-6	35	6	20	30	32	8	19	10	21	30	21	21	50	26	49	50	16	-21	-48	50	50	37	50	50	50	50	50	50	45	37	50	50	35	50	
0	50	22	0	50	20	1	50	31	21	50	0	0	50	20	11	0	32	40	50	11	12	1	30	50	11	11	-21	-20	12	11	20	50	10	32	-20	-21	21	21	-10	
30	30	30	30	30	30	30	40	30	20	30	20	20	30	10	41	20	0	41	30	10	40	0	0	10	0	30	-31	30	30	30	30	30	10	10	0	0	30	30	0	
22	26	21	21	24	23	24	19	22	22	20	21	21	23	23	23	24	21	20	21	19	20	21	19	19	15	19	23	22	23	25	27	25	21	24	24	22	22	20	17	
33	24	25	25	22	22	22	9	8	7	40	41	42	41	43	44	8	6	5	20	22	24	-9	6	5	-10	-10	12	-11	21	11	9	19	22	19	22	19	10	9	21	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	1	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	30	20	10	30	20	10	40	29	20	30	20	9	9	20	30	10	20	30	9	20	30	0	0	0	0	0	10	10	10	10	0	0	0	0	0	0	0	20	20	30
40	40	40	40	20	40	40	40	40	40	40	30	30	40	40	50	30	40	50	30	40	50	40	40	40	40	40	20	40	40	30	-10	-10	-20	-20	30	10	40	-10	50	
10	5	6	8	7	8	11	5	7	10	8	6	10	8	11	18	7	10	50	11	16	48	-33	-32	-45	23	29	23	27	28	26	26	29	28	26	27	28	28	33	40	
-50	20	-50	-50	28	-50	-50	13	-50	-50	30	-50	-50	22	-50	-50	23	-50	-50	5	-50	-50	18	-50	-50	29	9	8	22	11	14	10	13	36	35	40	18	-24	31	-46	
41	20	31	41	30	30	41	30	41	50	20	30	41	31	30	31	30	31	31	20	31	50	20	32	50	21	31	26	28	23	15	14	19	19	15	11	21	18	28	20	
-31	20	50	10	41	20	0	10	50	10	50	-10	30	21	30	50	20	34	50	9	21	50	20	-31	20	-10	20	10	41	20	-30	-50	-30	-41	-31	0	0	31	-10	10	
30	10	20	30	20	21	41	20	19	32	0	0	0	20	20	40	20	20	40	10	0	30	-22	20	-41	30	41	0	0	21	30	-21	20	-20	20	-10	20	41	41	10	
8	49	49	9	47	28	0	50	50	9	50	16	1	18	36	36	1	34	34	2	30	44	1	1	33	16	12	1	1	32	16	36	35	43	43	1	1	15	18	1	
0	50	25	0	50	-10	0	50	23	24	32	27	0	26	13	38	33	10	44	0	-11	23	-37	15	0	-4	-6	-19	21	14	-18	-50	-50	-48	-50	0	16	0	18	17	
6	31	-13	21	33	24	-18	50	14	14	50	-50	-50	0	0	25	0	9	33	-50	-50	-50	0	-16	6	-25	-25	-18	10	15	15	-50	-23	0	12	-42	-25	10	10	0	
20	50	30	10	50	30	15	50	40	20	50	30	10	50	20	50	50	50	50	50	50	50	30	30	20	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
10	20	19	20	0	0	0	20	19	19	0	0	0	30	31	30	30	41	50	30	30	30	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	50	50	50	50	50	50	49	49	49	48	0	-1	50	50	49	0	0	-2	50	50	50	48	47	44	49	49	47	40	34	29	31	30	39	40	39	37	37	36	32	
25	14	37	-40	0	0	-48	21	14	21	28	-12	-32	7	34	0	7	38	47	7	0	18	31	45	14	20	50	6	47	44	5	-20	-17	0	0	0	-1	30	14	31	
10	40	40	20	50	20	30	40	40	40	50	20	30	40	30	40	40	20	50	20	30	40	10	-30	-20	-10	30	-40	30	10	-10	-50	10	-20	20	0	10	0	20	-10	
-39	50	31	-31	50	30	-39	50	41	-21	50	24	-50	50	21	-40	-50	-11	50	50	20	-41	50	30	-41	10	-11	50	50	31	-31	31	30	21	20	-41	-40	-40	-40	-31	
-11	4	3	5	6	8	8	7	10	9	-11	-6	-4	6	6	8	4	5	6	-16	-22	-11	-28	-23	-26	20	21	-3	6	-2	3	3	6	2	-5	11	-21	8	11	9	
10	20	31	10	21	20	0	10	20	-11	20	20	-31	10	30	0	11	21	10	10	41	21	10	41	10	20	-11	10	0	21	10	20	10	0	0	10	10	20	10	10	
-50	50	20	-50	50	50	0	50	50	50	50	-50	-50	50	0	0	0	0	50	0	0	50	-50	0	0	-1	20	0	21	-1	0	0	0	0	0	-50	0	30	31	0	
41	31	37	43	47	35	44	40	46	42	43	49	48	48	46	44	44	47	47	45	47	47	50	31	23	39	23	40	26	27	33	18	21	21	21	21	32	45	42	46	
10	9	20	0	10	20	0	20	20	20	20	30	-11	0	0	10	0	10	20	-11	-11	-11	11	-21	0	30	19	0	0	10	0	20	9	-12	-12	0	0	10	9	-21	

81	82	83	84	85	86	87
19	17	21	4	24	28	18
50	10	-40	30	30	50	50
-9	-25	12	0	-10	50	50
0	0	50	6	6	50	50
7	-5	8	10	-18	12	15
10	14	13	21	17	16	17
-11	-10	4	5	10	0	0
16	50	50	50	50	50	50
30	50	50	31	30	20	50
0	40	40	40	40	50	50
27	21	23	22	20	25	19
21	9	10	50	19	31	-9
0	0	1	0	0	0	0
50	50	50	50	50	50	50
30	10	10	21	30	31	30
0	50	50	50	50	50	50
28	25	27	37	25	35	31
21	22	29	24	29	22	25
19	23	26	23	10	26	24
10	20	10	0	0	0	0
41	20	20	0	0	20	21
1	38	37	0	0	0	34
2	25	11	14	12	41	40
0	23	23	-44	-43	24	24
50	50	50	50	50	50	50
0	0	0	0	0	0	0
31	34	50	49	48	34	29
47	46	8	24	5	49	-39
0	40	40	10	10	50	-40
-30	40	-41	10	20	50	50
16	-11	-22	-15	-14	-12	-14
0	30	10	0	0	10	21
0	20	0	50	50	50	50
37	45	47	32	28	28	43
-21	50	41	20	3	0	0

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
421	2	2	1	1	4	8	0	50	50	1	40	1	40	40	0	30	50	0	25	25	25	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
422	2	2	2	2	4	10	0	0	100	1	50	2	50	-50	-50	50	1	50	-50	-50	-50	-50	50	50	50	50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50
423	5	5	1	1	1	15	16	14	2	2	5	2		3	-23	-17	4	7	40	-8	6	-35	-7	5	-27	5	11	-17	-15	17	-19	10	13	10	6	19	-6	7	17	-6
424	5	5	1	1	1	24	2	33	25	2	-13	1	-32	19	15	22	18	23	25	24	24	7	19	-9	13	13	17	13	13	17	16	23	14	25	20	14	11	16	12	17
425	6	3	1	3	3	50	0	51	20	1	10	2	0	-22	-20	-10	10	5	0	0	10	0	-20	30	30	30	0	0	-40	40	40	30	20	20	-50	50	50	30	40	40
426	3	3	2	2	3	84	0	86	85	1	41	2	0	0	0	0	30	25	40	-11	13	-35	20	-5	30	17	20	14	0	0	40	37	24	0	-4	40	42	31	-7	43
427	2	2	2	3	1	25	0	100	90	1	30	2	0	0	10	-50	0	50	20	-10	50	-10	50	50	0	0	50	0	0	50	50	0	50	0	0	50	0	0	50	30
428	5	3	2	2	4	100	70	50	50	1	31	2	0	21	20	11	11	20	20	31	31	41	0	10	30	30	-21	-21	-21	-31	-30	-30	-31	-31	-30	0	-1	0	10	20
429	4	8	2	2	0	102	4	91	9	1	30	1	45	31	30	30	31	41	31	30	31	21	10	10	31	41	10	10	10	10	20	21	10	10	10	31	31	31	10	30
430	2	3	1	1	4	101	0	30	39	1	26	2	0	-30	-40	-50	20	50	50	-10	30	31	-21	0	19	22	50	22	-50	49	24	-50	49	27	-49	50	25	-48	49	23
431	4	4	2	2	4	24	1	89	22	1	19	2	0	-50	-50	-41	40	-31	14	-41	-42	-41	0	-20	40	0	23	30	-30	50	50	0	19	31	0	32	38	0	30	42
432	3	3	2	2	3	124	0	50	50	1	50	2		0	50	20	50	41	10	-20	30	31	-20	50	30	50	20	-50	-50	50	30	-41	20	0	-50	50	30	-50	50	50
433	4	3	2	2	4	49	0	29	71	1	30	2		-50	50	20	50	31	20	-21	20	5	10	50	50	50	50	-50	-50	50	30	-50	50	-50	-50	50	50	-50	30	50
434	2	2	1	1	3	161	34	34	7	1	25	2	-50	-50	-50	26	6	-16	5	-26	15	-15	-24	-15	20	24	-24	-37	-37	-50	23	-50	-50	-50	-50	-50	13	-50	-50	4
435	2	2	1	1	2	75	0	90	70	1	30	2	0	0	0	10	20	0	10	-10	0	-10	-10	0	12	26	20	20	-50	22	10	-11	21	12	-50	37	21	-32	27	20
436	3	3	2	2	2	10	0	2	10	2		2		30	30	30	21	31	50	20	41	20	0	0	20	13	0	0	0	31	32	18	0	0	0	29	30	17	35	32
437	6	3	2	2	4	23	2	4	6	1	10	2		29	30	30	20	20	9	19	9	9	20	40	39	39	-11	-11	-11	9	9	9	-11	-12	-12	9	30	31	20	20
438	2	3	2	2	3	23	9	40	50	1	20	2		-30	-31	-41	20	0	10	-10	20	-50	50	10	31	32	40	41	-10	50	31	10	50	31	-50	50	41	21	41	50
439	3	3	2	2	3	107	1	19	100	1	50	1	32	30	0	0	40	31	0	1	-1	0	0	20	19	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	2	2	1	1	3	138	99	1	0	1	30	2	0	0	10	20	20	11	10	-10	10	-50	-10	50	21	10	50	-11	-50	50	30	10	50	10	-50	50	20	10	50	41
441	3	3	2	2	3	23	9	9	19	1	20	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
442	3	3	1	1	2	29	4	9	3	2		2		10	-9	12	8	9	8	2	4	5	0	5	6	9	11	12	4	5	7	9	11	10	7	9	10	10	10	10
443	6	3	1	1	3	85	19	70	19	1	25	2	0	0	0	20	10	21	20	11	20	10	0	11	10	20	20	0	0	21	10	10	21	0	0	20	9	10	21	30
444	3	3	1	1	1	10	8	49	10	2		2		40	35	27	20	30	38	34	31	20	13	8	36	36	-6	9	9	10	35	40	23	7	7	46	50	50	41	49
445	3	3	2	2	3	125	91	9	100	1	45	2		20	30	-50	50	0	-18	16	15	-10	50	50	50	50	50	-50	-50	50	50	-50	-50	-50	-50	50	50	-50	50	50
446	3	3	1	1	3	30	50	20	29	1	10	2	5	-50	-40	10	-7	-23	-15	10	40	-10	-5	40	50	45	50	-50	-50	50	50	50	50	-50	-50	50	50	50	25	40
447	6	3	2	2	3	23	12	17	45	1	29	2	0	-43	-34	-36	38	38	-4	-3	25	-4	20	23	23	3	21	19	-50	37	49	11	37	27	-50	50	44	9	50	50
448	3	3	2	2	3	99	1	81	8	1	40	2		-11	-41	-21	-10	10	20	20	21	31	10	-41	9	49	40	40	10	41	40	41	30	21	-10	41	41	40	41	41
449	4	3	2	2	3	4	9	19	70	1	30	2		-41	20	0	30	20	10	9	30	-10	9	20	41	9	40	20	-41	50	30	20	40	10	-50	40	40	20	30	40
450	2	2	1	2	1	1	1	1	90	2	35	2	-20	10	-20	10	-10	5	40	20	20	1	-10	30	30	5	30	-10	-40	30	30	-20	40	30	-50	40	20	-50	40	30
451	4	3	2	2	2	49	29	9	70	1	30	2	0	0	0	10	20	30	38	10	9	0	-11	-11	40	30	30	30	0	-21	50	30	50	50	0	50	50	50	0	50
452	4	3	2	1	4	24	0	19	9	1	0	2	0	20	0	20	20	20	0	20	20	20	0	10	0	30	9	9	31	10	10	41	10	9	40	9	11	42	9	9
453	4	8	1	1	4	49	50	49	100	1	31	2	0	-41	-41	-40	50	41	41	0	-1	0	20	21	50	50	50	50	-50	30	50	-21	50	50	-48	50	50	-31	30	50
454	3	3	2	2	3	15	60	3	29	1	43	2	0	-31	-40	-21	50	20	10	0	31	-31	0	40	20	18	41	40	0	50	50	50	50	31	-30	50	50	50	50	49
455	3	3	2	2	4	152	10	20	51	1	42	2	-10	21	40	31	50	41	50	20	21	31	50	21	31	11	10	10	11	50	20	30	11	10	10	10	10	12	19	9

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
0	-1	-1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	-1	1	0	0	0	0	0	10	-10	30	30	50	50	50	50	-10	-10	25	25	50	50	-25	
-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	50	-50	-50	50	-50	-50	-50	50	50	50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	
8	17	-13	9	6	-11	10	14	-19	16	14	-15	20	17	-15	16	24	11	7	-12	-12	11	15	-13	-7	-19	-10	-18	-16	-9	-11	-15	-18	-20	-23	-10	47	-28	-28	-31	
17	13	15	18	17	14	14	13	16	23	15	18	18	13	-18	9	18	-18	16	-16	-7	10	18	15	11	-8	-12	15	17	23	13	9	16	11	-26	-14	-6	-9	-13	-7	
-10	50	50	0	30	30	10	50	50	10	30	30	0	10	20	20	-30	-30	30	0	0	0	0	0	20	-8	10	-10	11	0	10	0	0	-10	10	0	5	0	10	11	
30	6	41	22	-10	41	0	0	41	41	20	30	-1	4	47	46	30	45	50	-5	48	50	-2	-27	-21	36	25	0	10	20	-5	30	5	-10	10	0	0	1	10	3	
0	50	30	0	0	0	0	0	0	0	50	0	0	0	0	50	50	50	50	0	0	20	0	0	10	0	50	0	0	50	50	50	50	0	10	0	0	50	50	10	
31	9	29	31	0	0	0	0	0	0	-31	-32	-31	-20	-21	-20	3	3	3	13	25	26	-10	-11	-10	41	40	41	41	31	31	41	41	41	41	41	41	36	35	40	
31	10	30	30	10	21	30	20	31	31	10	31	41	11	31	41	9	31	41	5	30	41	5	31	41	41	41	31	31	31	31	41	30	41	30	41	31	41	31	41	
-33	50	22	-32	49	22	-30	49	25	-29	49	26	-32	49	19	-1	42	11	24	37	-22	31	-50	-38	30	-50	-50	-41	31	24	25	24	25	-30	25	15	19	-32	25	23	
5	50	50	-1	41	44	0	50	50	0	41	50	0	50	40	0	50	50	50	0	0	0	9	-45	17	13	15	19	0	-12	-31	0	0	0	0	0	-16	-10	-10	-14	
50	49	30	31	50	31	30	50	30	31	50	-31	-31	50	31	50	20	20	50	-3	-2	-1	-50	-31	20	10	10	-11	31	10	-11	20	20	-20	-21	10	20	10	30	10	
-31	50	50	30	50	20	20	50	31	-20	50	-50	-30	30	-50	30	-10	10	50	0	0	0	-50	-50	-50	10	50	-30	50	31	-20	50	50	-50	-31	30	50	40	20	10	
5	-50	5	5	-50	-50	-50	-50	7	7	-50	-50	-50	-50	4	-50	-50	-50	-50	-50	13	4	4	4	5	25	25	34	36	44	24	34	24	27	25	24	43	50	32	26	
-20	19	12	-14	17	13	0	-3	-3	-4	36	4	-40	18	10	6	23	29	20	14	14	11	0	0	-16	20	22	21	20	-13	-8	0	0	-12	0	0	10	0	16	13	
16	21	19	8	30	25	5	38	36	12	-1	0	-19	0	0	0	-42	-41	-31	0	0	0	0	0	0	19	16	21	20	24	19	0	10	-6	-6	0	0	0	16	18	
20	10	9	9	10	39	39	-12	18	19	20	-10	-11	10	9	10	9	10	9	10	10	11	20	18	19	10	-1	20	-1	20	20	20	0	9	8	9	9	20	20	30	
31	50	41	20	-10	50	41	50	46	30	50	41	-31	-11	10	31	0	0	0	10	0	0	5	0	0	20	20	21	20	30	50	50	30	-10	0	20	12	20	21	31	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	9	9	9	30	0	10	0	19	30	22	20	20	21	20	20	20	20	19	
-50	50	30	-50	50	50	-50	50	41	10	50	10	-50	31	20	-10	-11	20	-50	10	10	-31	-31	-50	20	10	20	0	0	-11	-22	-49	-50	-48	-41	-40	-39	9	9	21	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	2	0	11	
3	11	10	4	9	10	9	11	12	12	11	11	11	9	9	10	9	9	9	10	8	8	12	8	7	13	22	18	19	19	18	20	20	19	20	22	21	21	21	20	
0	20	31	10	20	20	0	20	21	10	20	10	10	0	0	0	0	0	0	0	0	0	1	1	11	20	20	20	21	31	21	10	21	0	11	0	0	20	20	21	
25	50	38	25	50	50	31	50	42	40	50	31	17	50	34	26	27	34	38	20	12	11	26	25	25	20	-20	35	-26	38	25	42	5	9	10	9	12	23	44	36	
-50	50	50	-50	50	50	-50	50	50	-50	50	-50	-50	50	50	-50	20	50	-50	-20	-21	50	-21	-21	50	-13	-12	22	-19	-13	-50	-50	-50	-50	-50	0	-12	-26	-27	-23	
31	50	30	30	10	26	26	50	50	50	50	-40	-50	50	50	50	-10	20	50	-50	-50	-50	-50	-50	10	10	-5	-5	50	20	-50	50	-41	13	-12	20	-31	24	-9		
22	34	34	15	50	36	0	50	44	15	50	12	-50	50	50	50	31	28	50	36	31	50	-41	-42	0	6	-36	0	0	43	-4	50	38	3	0	0	-1	20	19	29	
35	41	40	40	30	36	23	36	35	7	33	29	8	36	39	36	40	37	49	37	35	38	29	36	32	10	18	6	-5	17	12	16	10	21	16	10	14	27	-4	16	
10	50	41	20	41	9	-10	50	39	20	50	0	-31	30	9	20	30	10	41	0	20	50	-21	-21	-11	9	30	0	40	20	0	0	0	9	0	-32	0	9	50	30	
-30	50	40	-20	40	30	-40	50	30	-20	50	30	-50	50	30	-20	50	30	10	40	20	5	-30	-20	50	-30	-20	-20	-20	-20	-20	-20	-20	-20	-30	-30	-10	5	-40	10	5
9	50	50	0	50	50	50	50	50	50	50	0	0	50	50	50	0	26	50	11	30	50	50	-31	-50	19	41	31	41	50	0	-20	0	0	0	20	20	50	50	30	
41	11	9	41	9	10	41	11	10	42	10	9	30	10	9	40	10	9	50	10	9	0	-11	-13	0	9	20	41	40	20	20	10	9	20	20	10	9	50	50	20	
0	50	50	0	30	50	50	50	50	10	50	20	-50	50	0	50	0	0	50	19	50	50	50	0	-31	30	50	31	31	50	20	0	0	-30	0	31	21	50	50	50	
50	50	50	50	50	49	50	50	50	50	50	50	-38	49	50	50	50	50	0	50	50	9	-31	-31	0	0	-50	-49	50	50	10	10	14	27	48	49	41	33	0		
21	11	10	10	20	21	20	18	7	11	7	8	14	7	16	16	9	10	11	21	29	32	10	1	12	30	30	10	10	42	42	30	30	30	41	40	40	37	37	31	

81	82	83	84	85	86	87
-25	0	0	-10	-10	0	0
-50	-50	-50	-50	-50	-50	-50
-29	-24	-22	-27	7	-26	-26
10	25	30	31	22	13	10
-11	18	21	0	0	21	21
0	37	30	48	46	49	49
50	50	50	10	0	50	50
41	50	50	42	40	41	41
31	41	41	31	31	41	31
24	22	22	26	26	25	25
-11	0	0	0	-11	-10	-11
30	50	50	10	10	30	30
10	50	50	50	50	50	50
31	-30	-36	22	29	28	45
0	50	50	5	4	5	9
13	22	17	23	14	31	30
20	9	10	9	11	9	10
31	50	50	50	50	50	50
19	0	0	0	0	10	10
-46	11	9	5	6	11	10
5	8	0	3	10	2	7
20	33	34	21	20	14	14
21	10	10	20	20	20	21
9	-27	-25	25	25	39	42
-23	50	50	-50	-50	-50	-50
-10	34	34	10	10	20	22
-8	27	31	26	24	50	50
9	8	-13	41	6	23	14
30	50	20	0	5	41	50
5	20	20	5	5	5	10
0	50	-31	50	50	50	10
20	9	9	0	0	0	0
0	50	50	50	50	50	0
0	50	48	50	50	50	50
31	35	35	40	40	40	40

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
456	3	2	1	1	3	84	0	100	66	1	40	2	0	0	0	50	25	50	25	0	10	-25	0	10	41	25	0	0	0	50	50	50	0	0	0	50	50	50	50	50	
457	5	2	2	2	3	24	1	71	91	1	9	2		-10	-10	3	10	10	4	-5	-5	-4	-3	-3	31	10	10	-7	-6	42	41	42	21	-10	-9	50	50	50	21	21	
458	4	5	1	1	5	49	50	90	83	1	20	2	20	32	20	16	50	33	13	18	16	28	28	40	42	42	28	30	30	-6	27	25	50	28	-22	19	37	29	33	17	
459	5	4	2	2	3	55	2	48	29	1	31	2	-47	-21	-50	-21	0	11	-22	-25	-27	-21	-29	-11	-2	10	-50	-50	-50	-50	-50	-50	-50	-50	-50	-49	-50	-50	-23	-22	
460	2	2	1	3	4	120	30	50	40	2	40	1	40	36	20	30	30	30	20	30	40	20	10	30	10	20	50	35	40	30	30	30	50	40	35	50	40	40	50	40	
461	3	3	2	2	3	51	9	51	71	1	-3	1	3	7	4	-7	5	-4	5	-5	6	-5	3	4	8	7	4	6	6	4	3	7	6	7	5	2	3	5	4	5	
462	3	8	1	1	2	24	0	52	48	1	-48	2		3	3	3	30	21	12	11	9	8	16	24	23	11	29	-20	-47	19	11	-11	20	20	-45	21	20	-9	19	20	
463	3	8	1	1	3	3	0	2	10	1	20	2		-10	-20	0	-10	10	0	0	10	0	-10	50	40	10	-10	30	0	50	30	10	40	40	-10	50	40	10	30	40	
464	3	3	2	2	4	75	4	20	19	2	1	2		-1	2	-10	10	5	50	4	10	2	1	50	10	20	50	-10	-10	50	50	-50	50	-50	-50	50	50	-50	30	50	
465	4	2	1	1	4	28	10	40	60	1	13	2	22	30	50	50	10	30	50	40	50	40	-50	50	50	50	-10	25	50	30	30	30	25	50	25	25	25	30	50	50	
466	5	5	1	1	4	51	10	41	49	1	34	2		29	13	42	41	43	29	24	25	30	-27	-31	-33	30	-48	-48	10	17	18	19	-50	-50	-50	22	48	-22	-14	23	
467	5	4	1	1	2	188	3	13	20	1	23	2	0	25	0	21	5	20	41	-11	10	-31	0	37	9	0	40	-39	-41	19	29	30	39	-40	-40	41	30	9	-21	41	
468	4	3	1	2	3	58	0	100	1	1	33	2	-42	-43	-41	-41	-22	43	50	27	40	50	-2	28	27	28	18	16	15	20	21	11	30	-36	-36	38	38	39	31	35	
469	3	3	2	2	3	25	10	10	10	1	10	2	0	-30	-50	-30	-40	20	40	0	0	-30	40	50	40	0	-50	-50	-50	50	10	-50	-50	-50	-50	50	10	-50	50	20	
470	3	8	1	2	1	200	60	50	19	1	10	2	6	40	41	41	20	41	50	31	50	30	-20	50	20	21	50	10	-10	50	19	20	50	21	-8	50	20	20	50	0	
471	2	3	2	2	4	150	1	80	15	1	35	1	45	-5	25	30	1	40	40	40	40	-20	-10	30	30	30	30	-1	-1	-22	-22	-21	19	-9	-9	40	40	40	30	-1	
472	2	3	1	1	3	2	0	0	1	1	30	2	0	0	20	-20	-30	30	-10	0	0	-30	20	40	20	-50	40	20	-50	40	30	10	40	20	-50	40	30	10	21	50	
473	2	2	1	1	3	100	2	59	80	1	41	2	40	0	31	-21	20	30	50	20	30	-11	-10	-10	10	10	-31	-31	-30	20	21	30	-21	-31	-40	17	24	21	10	28	
474	2	2	2	2	3	112	73	73	60	1	30	1	26	22	23	26	30	28	28	35	35	40	23	25	32	37	37	41	43	29	25	33	30	40	41	25	36	39	35	40	
475	3	3	2	2	3	10	0	71	30	1	11	2		-30	-48	32	50	50	10	-50	31	-50	-30	50	31	11	50	-29	-30	50	50	-10	50	-28	-29	50	50	50	50	50	
476	2	2	2	2	3	83	0	50	50	1	29	2	0	-31	-32	14	30	0	36	0	50	14	0	1	4	4	33	18	-37	50	26	7	40	13	-42	50	36	16	49	26	
477	2	2	2	2	3	65	5	80	15	1	30	2	0	5	-25	-50	35	10	5	0	5	-10	10	10	20	5	10	15	-40	40	20	-40	20	10	-50	40	10	-25	30	40	
478	4	4	1	1	3	10	4	49	80	1	19	1	9	-1	-10	25	41	26	50	1	25	-25	-25	26	26	10	41	31	2	50	50	10	40	31	3	48	40	10	38	22	
479	4	4	2	2	4	200	29	50	29	2	-10	2		9	9	20	19	40	30	19	19	9	-10	20	30	41	10	21	30	10	10	9	10	20	10	9	20	41	20	20	
480	2	2	1	1	2	45	5	85	18	1	11	2	-14	20	31	18	26	25	43	46	37	40	-14	21	31	13	28	41	14	38	43	14	34	45	16	33	46	14	45	44	
481	3	8	1	3	2	30	0	50	50	1	50	1	50	0	50	-20	20	50	30	0	0	0	30	0	50	25	0	50	20	0	50	20	0	50	20	0	50	20	0	50	50
482	5	4	1	1	4	12	0	100	5	1	31	2	0	21	21	11	31	50	50	50	50	31	-20	10	21	21	31	21	21	41	21	21	31	31	31	31	31	30	31	31	31
483	4	4	1	1	3	16	60	40	19	1	10	2	0	-20	-31	5	0	21	-10	0	20	-21	-11	10	10	-10	10	10	0	10	30	0	20	20	-11	30	30	30	20	41	
484	5	3	1	1	4	1	0	91	9	1	10	2		31	-30	0	10	41	41	-1	-1	0	0	36	31	41	50	-41	-50	11	50	36	50	-50	-50	50	50	41	20	50	
485	4	4	1	1	3	100	8	100	70	1	50	2		30	-50	50	50	50	50	9	50	50	-11	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
486	2	3	1	1	3	27	7	5	88	1	41	1	-35	-22	-11	-50	-11	20	-10	-50	50	-50	50	50	25	-25	50	-50	-50	50	50	20	50	-50	-50	50	25	0	25	50	
487	3	3	1	1	4	1	0	70	15	1	50	2	0	1	5	5	30	30	50	10	10	30	5	30	20	41	0	0	0	50	50	50	0	0	0	30	20	40	50	50	
488	5	5	1	1	2	23	1	19	19	1	25	2		26	-1	-1	-1	20	30	-1	20	20	-1	-1	20	31	20	20	-50	19	20	20	21	20	-50	21	20	20	19	20	
489	2	3	2	2	8	151	80	73	30	1	9	2	-10	-6	-9	-10	11	10	23	-3	10	24	32	-9	-10	-9	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	13
490	2	2	1	1	2	10	45	100	80	1	40	2	10	20	40	27	30	10	20	30	50	20	30	10	30	50	40	25	15	39	20	36	30	20	0	20	20	30	20	30	

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
50	50	25	25	50	50	50	50	50	50	50	25	50	50	26	50	27	26	50	25	24	50	0	25	25	27	50	0	0	0	0	0	24	30	40	0	0	50	50	0	
21	21	20	20	21	-6	3	50	50	50	22	-10	-11	50	50	50	10	31	50	-5	-5	50	-6	-5	4	-6	-4	4	4	10	10	31	31	10	30	1	1	31	30	-2	
42	48	35	17	42	-2	-14	8	9	13	16	14	11	23	23	21	16	16	15	31	29	19	-6	-7	-8	35	32	10	15	-15	-4	-21	-8	-31	-5	-10	-7	-8	20	-5	
1	1	-15	1	0	0	0	-41	-40	-22	-50	-50	-50	2	0	15	-22	-18	-1	1	0	0	-11	-12	0	41	29	42	30	29	11	10	10	40	41	40	39	40	39	40	
40	44	30	30	50	45	30	50	48	48	50	20	15	40	40	40	30	30	30	45	30	30	-50	-21	-21	50	40	50	40	30	30	-50	-30	-50	-40	-40	-30	-20	20	-20	
5	3	6	5	4	7	8	7	6	8	6	7	9	3	7	7	4	5	6	5	5	7	6	6	5	5	-6	7	-3	5	-3	3	-5	5	-6	3	5	5	4	4	
-10	20	20	-10	31	21	-21	30	19	-22	42	-18	-44	29	20	2	0	10	20	3	29	22	9	46	47	21	20	-7	-6	19	-10	-48	-48	-50	-50	-50	-45	-46	18	-50	
-10	20	40	0	10	30	10	30	20	0	10	10	0	30	30	10	0	0	0	0	0	0	-20	10	0	-20	0	-20	20	10	-10	0	0	-20	-10	-20	0	0	-10	20	
-50	50	50	-50	-10	50	-31	50	50	-50	50	-21	-50	50	50	-30	-50	-50	-10	-20	-50	-40	-31	-50	-10	10	50	10	30	50	10	50	50	10	10	50	10	31	10	21	
50	30	30	30	-10	-10	25	25	25	25	10	20	50	30	30	50	10	10	10	-50	-50	-50	-10	-10	-10	50	50	50	50	20	30	50	50	30	20	50	50	50	50	50	
11	21	20	-22	44	45	41	1	0	0	-50	-50	-50	9	37	-10	9	42	-10	10	-29	9	9	33	-9	22	19	49	49	24	21	35	20	31	12	15	-23	-19	17	24	
29	20	41	-19	19	39	-20	-21	41	11	50	-50	-50	21	37	35	-39	-37	30	0	0	0	-41	-20	20	27	31	-30	20	21	0	-27	-24	-25	-27	0	0	30	32	30	
35	30	30	30	37	24	-25	25	20	17	21	-18	13	24	18	20	-24	14	14	15	15	12	-34	15	39	24	20	23	26	23	24	29	29	29	26	21	-19	13	29	20	
-50	50	10	-50	50	-50	-50	50	10	-50	50	-50	-50	50	10	-50	50	30	10	50	-50	-50	-50	-10	40	10	10	-50	-50	-50	-50	-50	-50	10	10	-50	-50	-50	-50	-50	
-10	50	11	10	50	10	10	50	50	50	50	10	-9	50	20	20	50	21	21	-50	-50	-50	-50	-30	-29	-20	1	-31	-50	-31	-30	-50	-20	31	30	-31	-30	29	31	50	
-1	5	5	20	10	-10	10	20	-10	-10	19	-19	-30	35	30	40	40	50	50	15	20	30	-10	-9	-10	10	15	-30	10	5	-20	5	-5	-40	-40	-20	-20	-30	-40	-30	
10	40	30	-50	30	50	-20	50	30	-20	30	50	-20	10	50	50	20	20	20	0	0	0	20	0	10	-30	30	-20	20	50	0	-10	0	0	20	20	0	30	30	50	
26	11	13	15	-11	-9	-17	24	26	28	-20	-18	-14	-9	-11	-9	-14	-14	-11	-17	-13	-8	-7	-8	-14	50	50	20	13	13	15	50	50	50	49	21	15	21	27	17	
46	24	23	26	30	40	44	42	47	34	29	47	36	22	33	41	22	36	49	20	26	45	20	30	38	29	27	19	21	19	23	33	39	45	45	34	21	22	22	19	
50	50	50	-20	50	50	-30	41	50	11	50	10	-50	10	31	-20	50	41	10	-10	-10	-40	50	21	-50	-50	10	-50	20	-20	50	-41	-41	-41	11	-40	-10	-31	11	-40	
11	50	20	9	49	20	5	50	41	29	50	16	-36	50	35	2	10	16	36	20	20	47	21	20	21	41	41	21	20	48	48	30	30	19	19	15	16	41	42	0	
10	40	25	5	30	20	5	40	25	10	45	25	10	45	30	15	45	30	15	30	35	20	40	15	5	-40	-40	-40	-40	20	15	-10	10	-20	-10	-40	-40	-20	10	-40	
9	40	30	10	35	26	10	37	35	30	46	23	-2	27	24	19	-2	50	50	-3	50	50	34	39	15	26	36	25	36	38	25	26	25	30	30	27	25	40	41	41	
31	10	20	9	9	8	31	-10	-10	-1	21	19	10	10	18	41	10	9	30	-11	-11	10	10	0	9	10	19	-10	10	20	9	-22	-22	-22	-20	0	0	10	20	11	
25	32	38	26	43	26	11	43	46	16	47	48	15	19	27	31	34	25	32	25	26	32	-7	-16	-9	-15	-21	-34	21	41	30	44	27	33	34	-17	-13	37	39	39	
20	0	50	20	0	50	20	0	50	20	0	50	20	0	50	20	0	0	0	0	0	0	0	0	0	0	33	33	0	0	0	0	50	50	0	50	0	0	0	0	0
31	31	20	21	32	20	20	31	21	20	41	31	21	50	50	50	50	50	50	21	11	21	-40	11	11	21	21	10	10	21	0	0	0	0	0	0	0	21	21	20	
9	20	20	20	0	20	-21	20	31	21	20	20	-10	0	10	4	-10	-10	0	-31	0	0	-10	-20	-5	-10	-10	10	10	10	-10	-21	-21	-31	-31	-21	-30	9	10	-31	
30	31	30	26	50	31	31	26	50	41	50	-50	-50	25	50	26	31	30	50	37	36	41	10	-30	-21	20	50	-16	11	50	-10	-20	-20	-21	-20	-50	0	31	41	31	
50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	50	50	50	50		
10	50	25	10	50	25	15	50	50	50	50	0	-50	10	0	50	0	-25	50	25	25	50	0	-25	-25	10	20	-50	25	15	-25	10	-50	0	0	50	10	50	25	-25	
50	50	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	20	20	11	20	20	9	19	20	19	21	20	-50	11	19	15	5	30	40	4	31	40	0	0	0	10	10	11	10	20	-20	0	0	0	0	0	0	20	20	0	
6	-50	24	43	-14	18	48	-28	13	30	-23	5	10	31	31	31	12	50	50	-4	3	5	6	-14	-4	41	50	11	-6	12	3	43	12	7	2	1	-3	20	8	45	
50	20	30	50	15	25	36	50	40	35	50	35	35	-20	25	50	20	30	20	-21	0	-50	0	-10	-20	50	20	-20	-50	40	20	-10	0	-5	10	20	10	40	20	10	

81	82	83	84	85	86	87
0	50	0	50	50	50	50
-2	21	21	2	3	32	32
-4	-7	40	18	37	43	34
39	40	38	41	40	39	38
30	30	30	40	40	40	40
-6	19	-6	9	6	14	14
-49	18	19	-27	-33	-34	20
0	0	0	10	0	10	10
31	50	50	-10	-20	50	50
50	50	50	50	50	50	50
17	-26	-29	16	18	46	18
8	0	0	11	11	21	19
23	26	27	24	23	21	17
-50	30	30	-50	-50	10	10
50	50	50	50	50	50	50
-20	45	40	10	5	40	-15
0	50	50	50	50	50	20
19	36	34	47	47	49	47
23	17	16	19	21	21	10
21	50	50	-30	-30	50	20
0	45	45	10	10	46	22
-40	-15	-50	-20	-20	10	10
26	50	50	50	50	50	50
10	21	31	9	19	19	30
41	22	9	41	28	38	44
0	50	50	50	50	50	50
21	31	31	0	0	31	31
-31	0	0	-20	-20	5	0
-20	50	50	-50	-50	10	-30
50	50	50	50	50	50	50
0	-25	-50	0	0	25	0
0	0	0	0	0	0	0
0	10	9	0	0	0	0
20	7	4	38	21	43	32
-25	35	0	10	3	50	20

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
491	6	4	2	2	4	48	9	60	40	1	30	2		-41	20	-47	-40	31	50	30	0	-50	-50	41	30	40	41	41	-42	41	41	-41	41	21	-41	41	41	-41	30	40
492	2	2	2	2	4	11	16	35	17	1		2		5	-14	-20	10	-30	11	18	15	-21	13	7	-9	8	9	-9	13	-12	10	-14	8	-14	9	-14	11	-14	11	-14
493	2	2	1	2	1	22	7	9	31	1	0	2	-12	-11	-12	9	-16	8	-13	10	-10	-18	-8	-16	9	-11	14	-13	8	-13	10	-10	9	-18	-35	31	-24	-11	-8	-13
494	6	5	1	1	3	0	0	100	0	1	40	2	0	0	0	0	10	50	20	-10	31	-11	20	40	-11	20	20	-10	-10	30	40	20	40	-11	-11	50	50	30	40	40
495	3	3	2	2	3	15	0	49	49	1	50	2	-50	-50	-49	0	-32	-1	5	-31	30	-30	30	50	49	-50	50	50	-50	50	50	-50	50	50	-50	49	50	-50	50	50
496	3	3	2	2	4	24	0	50	49	1		1		10	10	9	12	12	10	10	9	10	11	11	12	10	9	10	10	10	10	12	11	11	11	9	12	10	10	10
497	7	3	1	1	3	56	7	94	10	1	25	2	-50	-40	-50	-49	-40	5	15	-23	-19	-21	-9	5	-48	16	-8	10	-37	11	50	13	21	21	21	41	40	41	-6	30
498	3	3	2	2	4	11	1	9	6	1	41	2	-20	-31	-30	-21	-10	10	10	-20	20	-11	20	-10	20	10	20	-10	-10	10	20	10	20	-10	-20	30	30	0	-10	31
499	1	1	2	1	2	20	91	20	20	1	-20	1	11	9	10	-19	-19	-22	12	-20	-20	-21	-8	11	-8	10	-6	-10	-12	10	5	4	5	5	5	3	4	5	3	3
500	2	2	1	1	4	16	0	9	7	1	5	2		-50	-50	-50	28	0	0	0	0	-19	0	9	9	9	-16	19	18	14	9	9	15	-15	-15	12	5	-9	19	8
501	4	4	2	2	2	10	0	50	19	1	30	2	0	-20	20	20	10	31	10	10	10	20	-10	30	30	10	30	30	10	31	41	21	40	30	10	50	40	30	31	41
502	6	3	2	2	4	14	80	38	4	1	30	2		-10	-21	-11	-10	10	9	-2	20	5	-31	5	20	2	-20	31	20	31	40	41	10	41	31	50	50	50	31	31
503	2	2	1	1	5	77	9	29	29	1	18	2		-50	-50	-17	5	-37	40	18	31	-10	3	40	40	14	41	10	-50	50	41	-50	50	-19	-50	50	43	-30	50	50
504	5	3	1	2	4	29	0	90	9	1	30	2		-50	-50	-50	25	10	50	-30	20	-50	50	20	41	20	0	20	-10	-11	50	0	50	26	-25	50	50	50	9	50
505	4	3	2	2	3	126	0	48	70	1		2		21	10	-11	10	9	30	-11	30	-10	50	-31	-31	-31	-20	-20	-20	0	0	0	0	0	0	0	0	0	0	0
506	3	3	1	1	3	22	10	19	20	1	50	2	0	11	50	50	50	0	20	50	50	50	10	6	8	21	9	15	13	14	27	12	8	23	11	12	19	30	17	17
507	4	4	1	1	3	8	0	0	19	1	41	2		-11	20	0	10	30	10	10	10	10	0	-30	50	30	30	10	20	9	50	50	30	-10	10	50	50	50	10	50
508	2	2	2	2	2	74	9	19	8	1	29	1	41	30	10	20	50	31	50	10	30	-40	-20	40	31	30	30	29	30	29	31	29	21	20	10	21	20	19	19	20
509	2	3	1	1	2	125	2	50	50	1	10	2		50	0	30	20	10	5	20	30	30	10	50	20	10	50	-10	-10	50	30	10	50	-10	-10	50	30	10	50	50
510	3	2	2	2	3	200	91	9	1	1	41	2		-9	-21	-21	50	50	20	41	40	-20	32	-21	-21	21	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50
511	3	2	2	2	2	10	10	84	30	1	50	2		11	-21	32	21	20	26	-13	21	-30	-9	29	31	33	11	34	20	12	50	50	50	31	30	49	50	50	50	50
512	3	3	2	2	4	15	0	49	51	1	38	2	0	8	35	-12	50	17	14	-10	12	-50	30	-29	20	50	30	37	-37	37	28	36	50	29	-50	50	50	36	37	37
513	3	1	1	1	1	12	100	100	100	1	28	2	0	50	50	50	50	50	50	50	50	50	50	50	-50	50	50	-50	-50	50	-33	-50	50	-50	-50	50	-50	-50	50	50
514	6	3	1	1	3	22	3	8	2	1	30	2		-41	-41	-11	-11	41	42	9	10	21	10	41	40	20	30	29	-31	40	41	-31	30	10	-48	49	20	-50	49	19
515	3	3	1	1	3	71	10	80	10	1	50	2	9	19	50	20	30	50	10	20	50	-25	-29	20	20	41	50	31	20	30	30	20	50	30	20	50	31	20	20	30
516	2	3	1	1	3	25	30	35	35	1	25	2	-20	10	-40	35	35	45	10	-35	30	0	-50	45	45	45	45	-45	-45	45	45	-25	45	-45	-45	45	45	-45	45	45
517	2	2	1	1	2	12	0	12	0	1	40	2	50	13	50	50	30	50	50	50	50	-50	0	0	20	20	0	0	50	1	2	31	0	0	0	0	0	20	10	10
518	3	3	2	1	2	25	0	70	30	1	20	2	0	5	-16	15	0	25	30	10	30	9	-11	19	29	-5	30	9	-11	30	30	-11	40	9	-21	41	10	-21	25	37
519	4	3	1	2	4	77	2	70	29	1	20	2	-50	14	-21	33	-35	45	50	28	22	-34	-25	47	-49	-50	40	-50	-50	42	-50	-50	43	-50	-50	32	-47	-48	46	44
520	5	3	1	2	5	35	0	49	49	1	40	2	0	0	-5	2	9	30	-11	15	40	9	-11	30	-11	10	-21	0	0	20	-21	0	40	9	10	50	10	9	30	10
521	2	2	2	2	1	126	9	81	50	1	50	1	20	0	-30	6	10	31	50	-20	20	-35	25	30	41	10	50	41	10	50	50	20	50	31	-20	50	41	11	30	50
522	2	2	1	1	5	68	0	20	80	1	50	2		-30	50	-50	20	50	-20	-50	50	-50	50	50	-12	17	50	26	-50	50	50	-50	50	12	-50	50	50	-50	-33	50
523	3	4	1	1	3	40	10	60	30	1	10	2		-50	-10	-40	20	0	40	-20	0	-50	50	30	40	20	-10	20	-50	30	10	-30	-10	-30	-50	50	20	-30	-30	50
524	4	3	1	1	3	172	6	51	4	1	9	2	0	19	0	19	7	39	47	-1	-1	-10	27	0	21	27	20	20	20	0	0	0	0	10	11	0	0	0	9	20
525	3	3	2	2	0	3	0	0	100	1	25	2	0	-36	-36	-50	-50	25	50	-30	20	-50	50	18	18	39	50	50	10	25	50	10	50	25	-50	50	40	-10	20	50

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
41	41	41	41	10	41	-10	10	41	-10	41	-40	-40	31	-10	41	31	-41	41	-41	-20	-30	-20	-31	-40	41	20	41	41	41	20	-10	-31	-20	-20	-20	-20	41	10	41
9	-9	4	-12	-13	5	-11	13	-9	14	-12	10	-9	-15	11	-10	-12	-6	-7	-4	-9	-9	-12	-12	15	14	16	23	23	26	26	25	25	27	28	29	29	29	30	31
-26	-5	17	12	2	18	13	5	9	22	11	20	6	5	7	25	-6	9	15	7	21	14	9	11	21	-13	7	7	26	6	21	5	12	8	13	9	17	6	17	-11
10	40	41	10	50	50	0	50	50	50	41	0	0	40	40	20	0	0	20	0	0	0	0	0	0	-21	-21	-21	-20	-10	-10	-20	-20	-26	-10	0	0	0	20	-10
-50	50	50	-50	0	50	-50	50	49	-50	50	50	-50	9	50	50	0	20	50	0	0	0	50	-50	0	20	19	-50	10	25	-38	19	-50	-33	0	-22	0	0	6	-5
10	11	12	13	10	11	10	10	10	10	10	10	11	12	14	10	11	10	11	11	11	12	10	10	12	12	8	10	10	9	11	9	11	10	10	10	11	10	11	9
-19	22	32	-9	39	-38	-38	31	31	31	31	31	-7	30	30	30	20	20	35	-10	10	31	-16	-24	11	12	31	-30	-21	40	17	17	18	16	28	24	-13	21	21	13
10	20	31	10	20	10	10	21	20	20	21	0	0	0	10	10	10	20	30	0	0	0	-10	31	10	0	20	0	11	20	10	0	-10	-10	0	0	0	10	21	10
4	4	4	5	3	3	5	3	6	4	3	4	4	5	4	4	4	4	4	6	4	3	4	4	3	5	5	2	1	1	1	1	2	2	1	1	1	3	1	1
10	16	17	14	16	-18	-18	17	17	17	36	-23	-23	0	0	0	0	0	12	-6	0	4	7	5	7	0	0	12	0	24	-10	-11	10	-14	6	-20	16	12	8	0
0	31	31	0	31	31	0	30	30	30	36	20	0	37	31	20	10	26	36	20	10	31	40	20	30	-16	15	-21	14	14	-10	10	0	-10	10	-15	-15	20	20	-10
32	41	50	40	7	15	7	50	50	50	9	40	40	50	50	50	50	50	50	20	10	40	-10	-30	-31	-19	30	19	29	30	9	30	16	9	1	1	1	21	30	30
-50	50	45	-42	50	20	30	50	44	7	50	10	-50	30	40	20	50	41	41	20	32	45	-30	-50	20	21	10	20	40	40	30	41	10	-21	40	50	14	42	19	20
9	30	50	30	-50	50	50	-9	50	50	50	0	10	26	50	50	-1	50	50	25	17	50	10	-50	50	7	7	-50	-50	31	-50	50	-50	-20	-21	-34	-50	-20	-10	-50
0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	30	23	34	21	28	17	9	18	31	30	22	22	22	39	18	9	26	19	23	31	26	28	21	24	17	30	37	28	16	15	31	19	15	19	36	24	16	43	13
20	20	50	20	10	40	40	-50	50	20	30	10	20	10	30	50	10	10	50	0	10	50	30	-50	-20	30	30	0	20	50	-10	-10	-10	10	-10	10	10	20	50	10
19	19	21	21	20	20	19	22	31	30	36	29	17	29	25	31	21	19	29	25	25	23	23	17	37	32	30	30	30	33	28	44	39	34	32	27	33	35	34	33
1	50	40	10	50	20	-10	50	10	5	50	10	-10	50	30	0	50	30	10	50	50	10	0	0	20	5	5	-20	-10	-20	-20	10	10	10	10	0	0	-11	-10	10
-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	11	10	9	20	20	21	-10	-10	-11	-50	31	31	30	30	31	30	29	30	30	30	29	30	31	40
32	50	48	30	39	31	20	50	50	50	50	-1	-4	41	50	41	11	18	50	10	3	50	-10	-6	6	50	45	-11	28	40	-13	0	0	-10	-8	-8	-6	34	42	31
13	50	50	18	16	50	17	50	50	33	50	-17	-44	50	19	15	17	25	23	21	12	35	-10	-11	-21	47	31	-25	-23	17	25	34	28	28	38	22	50	37	32	18
50	50	-50	-50	50	-50	-50	50	-26	-16	50	-50	-50	50	-50	-38	50	-50	50	50	-50	50	50	-50	-39	5	7	7	7	6	7	7	6	8	10	7	8	12	7	11
-41	47	47	-11	49	30	-10	47	31	21	49	21	-32	49	30	20	10	9	40	9	10	40	-11	-10	47	2	-5	5	-7	20	30	-21	-21	-31	-31	2	2	19	10	-42
31	20	30	30	20	41	50	20	31	21	50	30	20	30	30	31	-20	31	50	-20	20	41	41	-19	-32	50	50	-20	20	50	50	50	50	-9	30	50	41	50	50	40
-45	45	15	0	45	45	0	45	45	-45	45	-15	-45	20	0	45	10	10	45	-20	-20	-20	-35	-10	35	0	35	-25	-25	10	10	-45	-45	-50	-25	-25	-25	-10	-30	-30
10	0	0	20	30	10	1	-50	-50	-50	50	-50	-50	0	0	50	50	50	50	0	0	0	40	30	-30	50	50	0	0	20	20	30	30	-40	31	0	30	40	0	20
4	36	29	0	50	0	0	20	25	5	50	0	-31	41	10	-10	26	0	20	10	15	24	10	-11	-3	18	13	41	7	33	24	-15	-6	-31	-6	-1	9	0	6	9
-48	49	-50	-50	45	47	-50	46	-47	-50	47	-47	-50	50	-49	-47	-35	46	43	28	-31	-31	-39	21	50	24	-21	12	-25	27	-23	24	-29	-38	-42	40	33	26	-11	-38
40	40	9	50	50	-50	50	30	10	30	50	-42	30	-11	-11	50	10	-31	50	0	-31	50	-21	-11	20	-21	20	-21	30	40	20	9	50	-21	5	30	50	20	50	50
50	20	50	21	50	-41	21	10	21	41	50	-50	-50	-50	-50	-50	50	11	50	50	-31	50	10	50	31	-2	50	-6	50	50	-10	2	50	-6	21	10	50	31	50	13
50	50	50	50	-50	50	50	50	50	50	50	-28	-50	50	-38	50	50	-49	50	50	-50	50	-50	24	50	-27	-32	-35	-41	50	50	50	50	-47	50	50	50	-25	50	50
-20	0	10	20	-30	10	30	30	40	20	30	-50	-10	-50	-50	-50	-50	-50	30	-50	-50	-50	10	-10	30	20	10	-40	-40	20	-35	0	-30	-50	-50	25	-10	20	10	-50
21	9	19	21	9	10	11	0	0	0	20	0	0	11	11	12	5	5	19	18	10	21	1	0	1	19	19	25	25	24	9	11	21	22	6	11	12	21	22	9
-30	10	50	-10	20	10	-10	20	50	-10	50	20	-50	-50	20	20	-50	-50	50	-50	10	20	20	10	50	-50	10	-31	10	10	-50	-50	-50	-50	-50	-50	-50	-50	10	-50

81	82	83	84	85	86	87
-41	-41	-41	41	41	41	41
32	28	27	29	27	26	25
-7	10	10	12	-6	13	5
0	-10	-10	10	10	10	10
-26	0	-50	-29	-29	20	6
10	10	10	10	10	9	9
18	30	30	15	-38	15	17
10	-20	-20	10	10	21	0
2	2	1	1	1	3	1
0	25	24	20	22	20	22
0	20	0	10	0	25	25
41	50	21	20	20	41	50
-21	42	20	-31	-21	-10	31
-50	50	50	50	50	50	50
0	0	0	0	0	0	0
36	30	23	16	34	21	24
10	0	0	10	10	10	20
29	32	33	33	33	33	27
-10	10	-10	10	10	10	10
41	50	50	50	50	50	50
0	50	50	26	22	23	14
50	31	42	50	50	50	50
7	11	9	12	19	16	12
-42	31	3	20	20	31	39
30	50	31	50	29	50	29
-25	-50	-50	-30	-30	-45	-30
19	-21	10	50	-50	41	-50
14	32	9	11	9	9	10
-23	18	33	18	28	18	33
10	50	50	50	50	50	50
50	-50	-50	50	50	15	50
50	50	50	50	50	-50	50
-50	0	0	30	30	40	40
10	22	23	33	34	33	33
-50	50	20	10	10	10	10

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
526	3	2	2	2	3	51	11	100	19	1	30	2		-50	-50	-50	50	-50	-31	-33	-50	-42	-43	50	11	26	50	50	-31	45	13	12	50	-50	-50	50	50	-25	50	16
527	5	5	1	1	5	60	75	25	1	1	42	1	42	25	1	1	42	43	-37	1	38	20	-50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50
528	6	3	2	2	6	129	19	90	19	1	50	2	-11	-11	19	9	30	41	40	19	9	10	10	-22	30	20	-42	-42	-41	-41	19	20	-50	-50	-50	-50	9	9	-50	10
529	2	3	1	1	2	10	0	100	5	1	21	2		41	-26	30	50	40	30	-31	10	-20	20	-11	20	41	21	-21	-50	20	20	-10	21	-31	-50	20	20	-20	20	40
530	4	4	1	1	4	37	2	97	1	1	40	2		3	-29	-27	-31	25	31	3	3	-3	32	-20	19	37	-35	-36	-36	-3	-3	-3	-37	-37	-37	-3	-3	-3	11	11
531	4	8	1	1	4	27	1	54	2	2	-11	2	-11	14	23	16	21	6	2	7	8	16	16	11	-3	8	-5	6	16	9	12	25	3	13	16	10	17	18	5	8
532	4	3	2	2	3	51	1	100	70	1	40	2	-49	-40	20	0	25	50	50	-26	41	-36	0	50	21	0	10	50	-1	50	21	20	10	50	-1	50	25	19	24	24
533	3	1	2	2	2	25	0	0	0	1	0	2	0	0	0	-10	-10	0	20	10	20	0	30	0	0	0	-20	10	10	30	30	30	30	20	10	50	50	50	20	40
534	2	2	1	3	2	75	0	40	60	1	30	2		-50	-40	-30	20	30	-20	0	10	-10	20	-20	30	50	-40	50	-50	20	30	-50	30	40	-50	50	50	-40	10	40
535	2	2	2	2	4	23	0	100	100	1	50	2	50	-50	-50	-50	50	0	20	-50	20	-50	50	0	0	0	-11	50	-5	50	50	50	50	50	-50	50	50	50	0	50
536	4	3	1	1	2	22	0	50	29	1		1	22	-31	20	20	21	29	21	50	50	30	31	-10	31	-10	20	41	30	31	21	30	41	21	21	50	50	50	21	41
537	3	3	1	1	3	61	5	69	19	1	30	2		-10	-40	-5	15	15	20	10	-10	-3	-10	20	11	-10	41	20	-10	20	30	10	30	20	-10	40	40	10	31	31
538	2	8	1	1	4	10	0	100	0	1	50	2	0	-50	-50	-50	6	0	-50	0	20	0	0	0	3	8	47	29	0	50	50	31	50	50	0	50	50	31	50	50
539	5	8	1	1	3	24	5	95	20	1	10	2		0	0	0	0	0	50	0	0	-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	6	2	1	1	4	130	0	51	50	1	50	2		11	-11	-22	21	21	10	-32	21	21	0	20	30	20	0	-21	-10	9	30	21	20	-21	-1	30	30	19	-10	20
541	4	2	2	2	4	22	1	30	0	2	10	2	0	16	8	26	22	22	18	32	18	22	15	0	0	27	7	15	16	0	0	16	0	0	11	0	0	22	0	0
542	2	2	1	1	4	15	6	81	80	1	36	2	2	-40	21	-11	21	6	15	-10	30	-20	19	20	28	10	13	4	-20	37	42	8	21	16	3	36	19	4	41	25
543	3	3	2	2	2	22	0	100	19	1	50	2	0	-50	-31	-50	25	38	20	0	20	-30	20	31	39	19	50	50	-50	50	50	50	50	-50	50	50	50	50	50	50
544	3	1	1	1	2	23	19	19	10	1	10	1	11	20	10	11	10	11	10	10	11	20	12	11	10	11	16	16	7	3	3	9	7	9	4	1	2	3	6	4
545	2	3	1	1	2	8	20	38	40	1	24	2		-29	-41	10	31	41	41	-31	12	-50	-1	31	-30	21	-12	-42	-30	21	-41	-42	-42	-42	-41	10	30	-41	40	-42
546	4	8	2	2	4	100	70	19	71	1	50	2	-10	-50	-50	-50	-26	20	20	10	21	-26	-20	-26	50	50	50	25	25	50	50	50	50	25	25	50	50	50	50	50
547	2	2	1	1	7	150	30	19	33	1	50	2	50	20	21	35	16	28	13	14	23	29	39	30	21	19	25	30	29	22	28	26	12	18	21	16	21	33	13	20
548	3	3	2	2	2	50	9	100	8	1	31	2	40	20	20	10	47	40	50	10	9	-48	-10	50	31	46	50	31	30	50	41	41	50	41	41	50	40	45	50	41
549	5	3	1	1	4	99	0	69	19	1	41	1	41	31	20	-10	50	30	21	30	30	-20	31	13	-9	19	-11	-20	11	12	-15	31	-24	-11	20	21	10	-14	12	-21
550	5	3	1	1	3	20	0	5	90	1	10	2	-10	-30	30	-20	40	35	25	10	20	-20	30	10	40	-40	-40	50	-50	30	10	-50	40	30	-10	50	40	-10	25	50
551	3	3	2	2	3	61	100	100	13	1	50	2		-10	-10	-13	26	-14	7	-8	-8	-8	-6	-50	-50	20	-50	-50	-50	-50	50	-50	-50	-50	-50	-50	50	-50	-50	50
552	3	3	1	1	4	49	0	7	99	1	9	2	0	0	20	-32	18	0	30	-30	30	0	-2	40	40	50	50	50	50	50	-2	50	50	30	29	50	39	38	50	50
553	4	4	1	1	4	99	51	20	75	1	30	2	-30	-31	-41	-30	21	24	33	-32	22	-27	21	24	23	15	30	-25	-26	10	-11	-21	12	-24	-25	10	-11	-20	20	11
554	3	3	2	2	2	0	0	6	5	2	0	2	0	0	0	10	0	0	0	0	0	0	-11	0	0	9	0	0	-50	0	0	-24	0	0	-50	0	0	0	0	21
555	6	3	1	1	3	127	0	80	0	1	10	2	0	-20	-32	-30	-9	11	8	-1	-32	-20	21	0	0	20	10	0	1	1	10	0	11	0	0	9	10	0	0	11
556	5	5	1	1	1	99	1	59	33	1	30	2		10	19	30	30	10	19	6	5	9	-10	9	20	30	10	20	30	10	9	10	30	19	10	50	40	30	40	40
557	6	3	1	2	3	26	0	29	19	1	31	2		0	-29	-30	-40	22	22	11	21	-10	11	-20	20	31	10	21	-10	11	30	21	22	22	-10	41	41	41	32	32
558	5	4	1	1	4	7	9	22	7	1	11	2		-20	-16	-27	-15	13	40	0	0	0	0	12	41	-10	41	-20	-44	50	36	0	28	-17	-50	50	40	9	41	50
559	4	4	1	1	5	40	0	50	20	1	50	2	0	-50	20	-30	30	0	20	-20	-20	-40	10	-30	20	20	-40	40	40	20	50	30	50	50	0	50	50	50	-40	50
560	3	3	1	1	4	25	0	15	10	1	40	2	0	0	0	0	40	40	10	10	30	10	0	40	5	20	50	25	-10	50	50	50	50	25	-20	50	40	40	50	30

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
7	49	19	5	50	24	5	48	20	11	49	-14	-15	50	29	-7	50	32	-4	19	44	7	-48	15	-36	48	50	45	46	44	45	43	-33	-28	-20	49	46	39	33	-41
49	49	49	50	50	50	50	50	50	50	31	50	50	43	50	49	4	49	50	43	49	50	-21	-21	-20	50	50	46	48	48	49	48	48	49	50	49	50	50	49	-31
10	-50	20	20	-50	40	41	-50	30	30	-50	-50	-50	-50	30	20	-50	10	10	-50	31	30	-50	29	30	39	40	20	19	39	41	40	41	40	40	29	39	40	40	41
10	31	30	-30	-8	30	-20	20	20	10	50	10	-50	30	3	20	11	10	50	10	10	40	10	10	31	14	16	20	21	30	31	6	-11	-31	-31	10	10	40	40	-11
14	-6	-6	-5	4	3	5	1	0	2	-34	-33	-30	0	0	0	7	8	10	-2	0	5	1	0	-1	12	11	0	0	0	0	-7	-6	-1	-1	-10	-11	21	23	23
11	4	14	18	7	10	15	8	13	19	4	13	17	7	15	16	-3	5	11	7	11	14	-3	3	1	7	13	15	16	7	9	16	17	19	13	10	14	18	20	17
-26	25	26	-26	50	10	-26	20	50	4	50	10	2	50	31	0	50	20	-1	50	9	0	25	24	0	-20	-20	-48	3	-40	-40	-41	-41	-40	-41	-41	-40	3	0	15
-10	40	25	0	0	30	0	40	40	40	0	0	0	-20	-21	-20	10	0	20	0	0	20	10	-20	10	-21	-21	-30	-30	15	5	0	0	-20	-20	0	0	0	5	10
30	20	35	25	45	20	0	30	50	-40	10	30	-40	-30	-20	30	-40	-10	50	-40	20	0	40	-40	11	-20	10	-30	5	25	-50	-30	-31	-20	-20	0	-10	-10	-20	10
0	50	50	0	50	50	-50	50	50	50	50	50	-50	50	50	50	0	0	50	50	-3	50	-41	0	0	50	50	50	50	50	50	50	50	50	50	50	50	50	50	21
22	21	31	31	41	20	30	31	50	31	50	31	30	41	31	32	41	41	32	30	31	41	31	-30	-21	-31	21	-50	50	30	-30	-50	-31	-50	-29	-20	20	-50	20	-11
10	30	30	-4	31	21	-9	30	40	21	31	9	-10	20	30	-7	10	30	41	20	10	10	-20	-20	19	-10	10	-4	6	-5	-20	-10	-9	-21	-20	-11	-10	-10	9	9
30	50	50	39	0	0	0	50	50	2	50	50	0	50	50	30	50	50	50	50	50	27	0	0	0	50	30	0	50	0	0	0	0	0	0	3	3	10	11	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	9	30	20	20	10	10	9	30	20	0	-32	-31	-10	9	30	9	-10	30	1	10	10	9	20	-11	0	9	-10	10	20	20	20	-1	-10	0	-10	-1	20	20	-21
19	0	0	8	0	0	7	0	0	20	0	0	10	0	0	14	0	0	13	0	0	12	0	0	13	0	10	12	13	14	4	16	4	15	9	7	10	7	15	11
1	32	34	10	15	40	11	32	35	29	42	19	5	43	36	32	-26	-26	-18	23	16	6	-4	-14	-4	-17	32	-31	-10	-20	-42	41	32	-19	-19	-11	-10	20	33	9
0	50	50	-30	31	50	30	50	50	50	50	50	-50	31	31	42	50	20	50	31	31	50	50	-31	0	0	30	-50	-50	0	30	0	30	-20	-20	-10	-20	0	50	20
3	2	2	3	3	2	4	-6	-4	-4	-6	-4	-5	-10	-10	-6	3	-4	5	3	2	2	-3	-4	-4	-7	-6	-6	-4	-6	-3	-7	-6	-6	-6	-7	-7	-4	-7	-10
-42	40	-42	-41	40	41	30	41	20	-41	42	30	-41	20	-20	30	-22	-41	30	-40	-10	40	-41	-5	20	-19	-2	21	10	10	-15	12	-16	10	10	9	12	-26	-19	18
50	50	50	50	50	50	50	50	50	50	50	25	25	-50	-50	-50	50	20	50	25	15	50	-50	-20	-20	-50	-50	-50	50	50	50	50	50	50	25	25	30	30	-25	
10	24	26	26	25	25	24	1	0	3	1	1	0	10	15	12	11	12	18	0	2	17	11	10	7	15	16	15	18	20	16	15	24	32	40	35	24	22	33	23
49	50	40	46	44	31	38	48	33	45	50	34	41	40	30	46	30	35	50	41	35	45	-47	20	-41	50	50	-21	10	-41	42	-40	50	-40	41	-20	30	-41	50	40
22	11	-14	14	17	-15	31	-21	10	-13	-19	-9	23	-11	-11	-22	-13	7	-8	-15	9	28	12	20	-22	-13	16	-17	30	32	-27	27	30	-27	34	26	-25	33	-22	-24
-50	30	50	-50	10	50	-50	50	50	40	45	40	-50	20	50	10	40	50	40	35	45	30	40	50	10	-10	20	40	10	45	40	-20	-20	-25	-30	-40	-30	-25	-20	-20
-50	-50	50	-50	-50	50	-50	-50	50	-50	-50	50	-50	-50	50	18	-50	-50	50	-50	-50	50	-50	-50	-50	50	50	31	21	50	50	50	50	50	50	21	20	31	32	30
50	50	29	41	-2	50	50	50	13	44	50	31	50	50	50	50	42	29	50	24	23	50	-34	-18	-37	50	50	1	11	10	29	50	50	6	37	13	47	31	50	8
10	11	10	20	21	-15	20	11	10	10	20	-20	-21	20	11	31	20	20	30	10	10	30	10	30	-11	11	10	10	-10	10	20	20	20	10	-10	21	20	20	9	-10
0	32	26	-50	20	23	8	30	30	0	40	0	-50	0	0	0	0	0	26	0	0	0	0	0	-27	10	9	9	10	0	0	0	0	0	0	11	12	26	24	24
0	12	10	0	0	0	0	20	0	0	31	0	0	20	10	0	0	0	10	0	0	10	0	20	0	0	0	-21	-19	31	20	30	29	31	30	0	0	20	10	0
43	40	40	40	41	40	41	20	31	30	20	21	20	30	19	30	9	20	50	19	31	41	10	19	21	9	-11	10	20	10	22	10	20	-12	21	-11	10	30	30	-5
31	20	31	31	10	10	11	21	32	32	20	20	-10	11	20	20	-10	11	15	0	10	22	-10	-21	-11	-10	-10	-10	-11	30	11	-21	-21	9	5	-20	-20	11	21	21
1	36	50	0	40	-10	-50	50	50	30	50	-11	-12	-12	13	9	0	0	19	0	11	27	0	0	1	-35	-20	-50	3	30	-21	-38	-33	-41	-29	-35	-30	10	0	0
50	50	50	50	-50	50	50	20	50	50	30	50	50	-50	50	50	20	20	40	0	0	0	50	-20	-20	20	40	20	20	40	0	50	0	0	0	30	50	30	0	-30
20	50	25	10	35	10	10	50	30	30	50	20	-10	50	10	30	20	-10	30	40	10	30	-50	10	25	20	50	-50	30	20	20	-30	40	-50	10	10	40	-10	50	-50

81	82	83	84	85	86	87
-42	46	-37	23	13	50	48
-27	41	40	49	49	48	47
10	40	40	40	41	50	50
-11	10	10	40	39	40	40
23	25	34	0	0	32	31
10	12	9	19	19	10	10
15	50	0	-50	-50	-49	50
0	20	10	-20	-20	0	0
-40	50	20	-20	-20	30	30
21	50	50	50	50	50	50
10	31	-10	41	41	-10	11
-20	10	20	19	30	-10	30
31	0	0	10	10	50	50
0	0	0	0	0	0	0
-21	20	20	20	20	30	29
9	10	10	9	15	14	13
-50	23	8	30	21	41	31
0	50	50	10	10	0	50
-6	-7	-6	-7	-3	-5	-4
-20	24	15	16	17	16	17
-26	50	50	50	50	50	50
20	21	21	22	26	28	13
40	42	-21	41	40	-30	0
-5	-10	8	-27	13	14	17
-20	40	10	-10	-10	50	45
30	50	50	50	50	50	50
0	50	50	36	50	50	50
19	10	10	20	19	10	20
24	0	0	0	0	0	0
0	41	41	31	29	20	21
13	13	7	16	9	9	12
22	31	31	21	21	41	41
11	11	0	-27	-29	10	10
-50	50	50	-50	-50	50	50
20	50	50	-30	-25	50	25

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
561	3	3	1	1	3	200	20	60	20	1	30	2		-10	10	-20	50	50	50	0	20	0	20	0	50	50	0	50	50	0	50	50	50	50	50	50	50	50	0	50
562	4	4	1	1	3	24	0	80	68	1	50	2	0	-50	-50	-50	-50	-42	-31	19	39	-50	9	10	9	41	30	30	0	20	20	20	20	20	0	20	20	20	20	20
563	1	8	1	1	0	16	0	19	80	1	10	2	0	-21	50	30	0	20	30	40	40	-20	0	30	10	20	20	10	10	20	0	0	10	0	0	10	0	0	20	20
564	1	1	1	1	0	5	0	10	90	2	0	2	0	-31	-10	0	16	50	40	0	4	0	0	30	-20	5	30	10	-10	20	20	-10	50	-10	-10	50	20	-5	20	50
565	4	4	2	2	5	123	49	51	55	1	0	1	-16	-20	-21	30	30	18	19	19	21	25	20	7	7	19	13	12	13	-28	-33	-31	-10	-11	-7	-10	-6	-6	-4	49
566	3	5	1	1	4	33	24	24	10	1	10	2	10	10	-4	-4	-11	16	-6	16	9	10	-9	8	-10	10	11	-10	11	10	-10	10	-12	-8	9	-13	-13	-13	-7	-6
567	5	8	1	1	5	6	1	4	1	1	10	2		10	-10	10	20	10	20	20	20	20	1	10	20	1	0	31	0	10	20	0	50	40	40	50	40	40	40	30
568	6	6	1	1	3	37	0	60	20	1	0	2	0	0	0	19	22	22	0	-1	-1	0	20	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
569	6	2	2	2	4	181	39	50	60	1	-32	2		39	-40	-50	-11	41	40	-1	38	-31	-31	0	-32	0	-50	-50	-50	-40	-13	19	-50	-49	-50	23	21	20	-1	-3
570	3	3	2	2	3	100	0	50	50	1	0	2	0	0	0	25	50	0	50	0	0	-50	0	50	50	50	50	-50	-50	50	50	50	50	-50	-50	50	50	50	50	50
571	3	3	2	2	3	100	0	50	50	1	50	1	50	0	0	50	50	0	50	0	0	-50	-50	50	50	50	50	-50	-50	50	50	50	50	50	50	50	50	50	50	50
572	5	4	1	2	4	60	0	80	20	1	21	2		-27	10	-16	16	-10	-37	-18	10	17	-11	30	20	21	-25	24	15	40	40	-11	19	-9	-12	50	34	22	30	50
573	2	2	1	1	2	7	20	40	51	1	10	2		2	2	50	50	50	5	-2	32	-6	-47	0	-1	-1	1	-2	2	10	2	-4	-3	6	15	-6	5	-17	3	-8
574	3	3	2	2	4	45	0	25	73	1	31	2		0	11	-10	25	21	15	5	20	15	21	18	35	21	21	30	0	41	41	21	20	30	-10	40	40	20	30	41
575	4	4	1	1	2	5	0	9	0	1	20	2		0	0	0	0	20	30	-1	0	0	0	30	30	30	0	0	0	50	41	0	0	0	0	50	50	50	0	0
576	3	3	1	1	4	76	50	53	80	1	41	2	-2	0	38	11	50	13	36	14	30	4	-18	31	32	50	32	20	-47	40	35	33	49	40	-46	39	40	29	36	32
577	7	8	1	3	5	30	44	16	74	1	27	2		21	22	19	20	18	50	17	21	18	16	27	27	27	28	31	30	26	27	26	28	29	28	30	31	29	32	31
578	7	7	1	1	4	38	6	85	13	1	21	2	-20	-14	-18	32	13	43	28	29	25	41	43	44	28	21	44	34	-14	43	31	-14	44	33	-15	44	31	-12	42	39
579	5	2	1	2	4	168	0	100	53	1	21	2	-50	-50	-50	-50	-50	-50	50	-21	21	-50	50	10	-4	-45	8	15	-28	-34	-28	-35	42	-50	-50	6	-18	-27	30	-19
580	3	3	1	3	5	30	10	80	10	1	25	2	0	0	0	20	20	20	20	0	0	0	0	20	30	10	25	40	25	50	25	25	50	25	0	50	25	25	20	50
581	6	4	1	2	4	9	1	20	0	1	35	2	0	10	-42	-31	20	9	10	10	21	30	-11	50	50	-10	0	-11	11	21	21	0	22	-10	0	20	21	-1	0	50
582	3	3	1	1	2	99	19	80	100	1	50	1	50	-50	-50	-50	50	50	50	-50	50	-50	-50	0	-33	32	-9	50	13	-8	-32	20	0	-9	18	10	47	19	-16	17
583	1	1	2	2	2	58	29	32	32	1	-8	1	-22	-15	-23	-11	-11	-11	-11	-10	-11	-10	-10	10	-28	-5	6	-3	-9	-7	18	-9	-12	-11	9	-6	7	-3	-10	-8
584	4	3	1	1	1	0	9	100	100	1	41	2	0	-20	-20	50	50	50	11	50	50	50	50	10	9	31	13	10	26	-24	23	16	22	35	50	15	21	50	29	19
585	5	3	1	1	2	87	0	65	19	1	50	2		50	50	30	50	50	31	-20	50	-31	50	25	50	50	50	10	-50	50	31	-50	50	10	-50	50	10	-50	20	50
586	4	4	2	2	3	187	0	10	90	1	31	2	0	0	-29	-32	19	11	-17	-10	37	-17	-47	30	32	-19	21	20	-23	15	22	21	22	9	-8	30	30	29	25	33
587	4	2	1	3	2	75	4	100	71	1	35	2		-50	-50	-50	-50	-50	10	-50	13	-50	30	-50	-50	-50	44	-50	-50	24	45	-50	50	-50	-50	50	50	-50	43	27
588	5	3	2	2	3	75	8	49	39	1	19	1	-42	-10	-50	-30	0	9	-12	-18	-22	-21	-19	-9	-9	-10	0	-8	-9	-49	-43	-43	-49	-50	-50	-48	-50	-49	-3	-2
589	3	3	1	1	1	11	0	4	49	1	19	2	0	20	20	10	40	50	41	-24	40	20	-21	31	20	10	50	-50	-50	50	40	40	40	-50	-50	40	31	31	50	50
590	3	3	1	1	5	151	68	44	41	1	31	1	31	25	28	26	28	18	19	29	26	34	26	30	41	21	21	25	20	23	37	13	30	19	20	26	23	17	21	17
591	3	2	2	1	0	0	0	0	0	1	-50	1	50	-50	-50	50	50	50	-50	-50	50	50	50																	
592	4	3	2	2	3	25	4	49	18	1	20	2	0	0	10	9	9	30	30	-32	-22	-42	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
593	3	3	1	1	3	8	5	90	0	1	0	2	50	50	0	20	0	-20	30	30	0	-20	-30	50	40	40	50	50	50	50	50	50	40	10	10	50	50	50	50	50
594	3	8	1	1	0	3	0	3	100	2		2		-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1																
595	4	4	1	1	2	200	38	49	64	1	22	2	35	33	34	39	45	39	45	38	40	39	33	40	39	38	29	21	32	25	24	14	33	20	41	26	31	22	17	23

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
50	20	50	50	0	50	50	0	50	50	0	50	50	0	50	50	-50	0	50	-50	0	50	0	20	50	50	50	0	0	50	30	50	50	50	50	30	0	50	50	50	
20	20	20	20	30	20	30	20	20	0	20	20	0	19	20	30	9	9	30	-11	-11	-12	-42	-42	-42	20	20	10	9	10	10	0	0	0	0	0	0	-12	-11	19	
20	20	10	10	10	10	0	20	0	0	0	-10	-10	0	0	0	20	20	20	0	0	0	0	0	20	0	50	40	10	10	10	10	10	0	0	10	10	20	10	10	
0	50	-20	-20	20	50	10	40	20	-10	40	5	0	50	0	0	20	-10	50	30	-10	50	-20	30	5	-30	15	0	50	20	30	0	20	-35	-10	-20	10	0	20	-10	
48	14	41	35	30	30	34	12	24	30	32	34	-41	-22	-22	-19	-17	-7	4	8	15	16	-1	0	2	-31	-32	32	31	28	30	35	30	34	10	13	14	23	18	-29	
-7	-9	-6	-3	9	8	10	8	9	9	10	10	10	-6	-6	-6	15	14	10	8	8	8	-6	-8	0	25	0	0	0	9	10	10	21	23	21	19	19	30	30	29	
0	40	20	0	50	10	0	50	50	1	50	40	0	40	30	10	10	30	30	20	5	10	-21	-11	10	-10	-11	-10	-5	5	-4	-11	5	-10	1	-11	10	-10	19	-11	
0	0	0	0	0	1	0	0	0	0	0	0	0	0	-2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	1	0	0	39	-45	38	20	0	20	49	-49	-50	-49	-49	39	-50	-49	40	-50	-50	2	0	0	0	30	31	19	20	50	50	50	50	40	39	31	30	50	50	0	
50	50	50	50	50	-50	-50	50	50	50	50	-50	-50	50	50	50	0	0	50	-50	50	0	-50	-50	0	50	50	50	50	50	50	50	50	50	50	50	-50	0	50	50	0
50	50	50	50	50	-50	-50	50	50	50	50	-50	-50	50	50	50	0	0	50	-50	50	0	0	0	0	50	50	50	50	50	50	50	50	50	50	50	-50	0	0	50	0
13	32	47	9	50	20	14	43	50	29	42	35	12	-13	20	34	-9	16	30	-4	20	34	-37	-33	-19	-22	18	16	36	34	21	-19	47	-13	37	-35	-5	-16	25	18	
-25	-6	23	48	35	50	-22	14	-19	27	-10	19	-10	-9	7	8	7	6	2	8	1	10	8	31	6	7	18	28	27	25	16	2	7	-6	-23	5	18	4	14	19	
30	40	33	30	21	41	30	41	35	31	30	30	-10	21	30	33	15	41	39	0	31	41	-14	-30	-5	20	21	-10	-10	0	10	0	0	0	0	20	30	0	25	0	
-30	20	50	0	41	41	10	50	50	50	40	20	0	50	-31	-41	0	0	0	0	0	0	20	0	0	10	-20	0	0	0	-50	0	0	0	0	0	0	0	0	-20	0
-1	46	48	19	38	42	2	41	43	32	48	30	-32	44	41	11	40	40	11	44	35	13	-46	-35	22	50	50	43	43	27	26	0	0	-10	-8	-9	-13	44	50	32	
30	30	31	31	31	32	30	29	30	29	30	29	29	32	32	32	33	30	34	33	32	32	30	32	34	26	25	27	27	27	27	26	24	28	26	26	25	26	27	27	
36	45	39	39	47	28	42	45	35	-11	44	31	-12	43	33	32	44	26	41	19	-12	38	-26	-12	-8	-17	11	-10	14	35	27	40	36	32	38	15	28	39	40	22	
-33	31	-23	-33	17	-28	-38	20	-39	-10	-19	-27	-16	5	-50	-50	9	-18	-26	22	-50	-50	22	-18	-36	50	1	-50	-29	-21	20	-21	-21	11	-26	-14	12	-14	15	-18	
35	50	25	10	25	25	10	50	25	10	50	25	0	10	50	25	10	25	50	10	20	50	10	0	20	0	10	0	10	25	10	0	0	-25	-25	-25	0	0	10	25	
-9	11	50	9	50	-10	-20	-10	50	30	50	0	0	50	31	31	50	-10	50	50	50	10	-11	11	10	10	-10	-10	0	0	10	9	0	0	0	-10	0	10	-11		
27	-5	-18	50	16	-5	46	3	31	50	1	-16	12	-4	20	50	50	9	50	-26	-11	50	50	-20	-31	50	50	50	50	6	-50	8	18	-50	10	10	-6	19	-9	30	
-9	-8	14	-24	-11	21	-7	-20	-10	10	-14	-11	-9	-12	-10	-6	-8	-6	-4	-6	-6	-5	7	7	-20	-9	-7	-7	-7	-6	-7	-8	-9	-8	-7	-8	-8	-8	-8	-9	
35	24	25	21	17	21	22	25	29	24	14	21	26	15	24	50	-33	-15	23	-30	26	20	-21	-15	23	50	50	50	50	50	45	50	50	26	-10	10	-41	29	11	21	
-50	50	50	-50	50	48	-48	50	50	-50	50	50	50	20	3	50	20	5	50	36	-7	50	-15	-36	29	50	50	-20	13	21	19	50	50	20	41	32	16	20	33	32	
-5	20	33	-1	16	-14	-34	18	20	30	11	34	-34	-11	8	30	-10	20	37	-23	22	24	-21	17	29	-24	-20	29	11	5	-22	-9	0	-9	-24	-22	-36	-21	-42	-27	
-50	50	38	-50	43	25	-50	50	37	-50	50	5	-50	31	26	33	5	2	50	-6	3	50	-14	-39	24	3	3	-4	-4	12	7	-17	5	5	11	32	16	8	4	6	
-2	-10	-12	-11	-12	-12	-12	-42	-43	-43	-49	-48	-50	0	-2	0	0	-2	-2	1	0	0	-49	-48	-49	20	30	9	10	9	9	9	20	20	20	9	10	11	9	9	
50	50	50	50	40	40	21	40	39	40	41	30	23	38	25	40	40	20	38	31	23	36	14	26	36	17	-39	37	13	37	-26	14	-12	19	25	47	-34	34	37	-26	
26	27	28	25	20	32	32	24	26	24	14	18	13	12	21	14	18	18	16	26	11	18	25	11	21	16	37	18	23	18	25	17	26	17	18	15	14	19	24	20	
-2	0	0	0	0	0	0	0	0	0	0	0	1	-3	0	0	0	0	0	0	0	1	-2	0	-2	30	30	0	0	40	29	19	0	-3	0	0	-2	0	0	-3	
50	50	50	50	40	50	50	40	50	50	50	40	40	50	50	50	30	50	50	30	50	50	40	50	50	-30	-30	0	50	-10	-30	-10	0	-10	0	0	10	30	10	30	
19	16	24	19	15	32	28	22	24	26	14	22	20	16	24	17	12	15	27	22	18	26	21	21	25	26	28	26	22	25	30	21	29	25	26	27	31	24	21	23	

81	82	83	84	85	86	87
50	50	50	50	50	50	50
20	19	0	0	0	0	0
13	20	8	0	0	30	30
-30	0	0	0	0	15	40
-25	-22	-20	-16	-20	-19	-22
32	15	15	16	15	20	20
11	20	20	20	19	21	20
0	0	0	0	0	0	0
0	49	-41	47	50	50	50
0	50	50	0	0	50	50
0	50	50	50	50	50	50
44	-37	-33	34	37	22	40
16	11	15	12	13	12	11
25	31	31	15	15	10	25
-20	0	0	0	0	50	-50
30	50	50	0	0	50	50
30	25	28	27	29	29	31
28	13	-11	20	29	48	47
12	-23	-19	-24	14	34	-41
0	50	0	0	0	25	0
-10	50	-11	10	9	10	10
24	4	9	-12	5	16	18
-7	-8	-5	-10	-10	-10	-10
16	21	10	9	36	28	38
38	39	30	35	22	38	50
-21	0	0	-26	-11	10	0
5	14	10	4	3	31	32
9	8	10	9	11	42	31
34	49	30	41	23	33	34
15	21	15	21	16	19	20
0	0	0	0	0	19	19
-10	0	-50	0	0	-10	0
20	17	23	23	23	31	23

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
596	5	8	1	1	3	17	0	80	19	1	21	2	0	24	31	0	0	39	16	-10	24	-30	19																		
597	5	3	1	1	4	4	0	10	1	1	-12	2	0	1	0	10	-10	0	30	20	20	10	-11	30	0	0	30	-11	-40	9	41	0	41	10	-50	50	50	-50	50	50	
598	4	3	2	2	4	100	10	100	0	1	50	2	0	0	30	-50	50	50	50	0	0	-30	50	50	50	50	25	-20	-50	20	50	50	50	-50	-50	50	50	50	50	30	
599	5	3	2	2	4	129	0	0	18	1	-21	2	-50	-50	-50	50	50	40	30	0	40	20	0	0	0	50	-50	-50	-50	-50	-50	-50	0	0	0	0	0	0	-50	-50	
600	2	2	3	1	6	9	20	24	96	1		2		0	50	21	36	3	50	21	23	16	34	50	50	-36	34	50	-50	39	5	-35	31	13	18	4	50	-21	-9	35	
601	2	2	1	1	1	100	0	19	0	1	50	2		-50	-31	-40	-30	-46	-50	-41	-41	-10	-5	50	30	31	50	0	-41	50	31	10	50	-11	-43	50	30	10	50	50	
602	4	3	2	2	6	38	0	50	10	1	50	2	-50	1	0	50	50	0	50	-1	-1	0	-50	50	50	-50	50	-50	-50	50	50	-50	50	-50	-50	50	50	-50	50	50	
603	3	3	2	2	3	100	50	29	50	1	31	2	31	0	0	0	20	42	0	20	20	-30	0	0	0	0	-1	0	0	0	0	0	0	0	0	-1	0	0	0	0	
604	3	2	1	1	4	74	0	40	9	1	40	2	0	-50	-50	-50	30	-20	-50	20	20	-30	40	50	50	20	0	0	0	30	40	0	0	0	0	30	40	0	50	40	
605	4	3	1	2	4	150	40	30	29	1	35	2		-50	-35	-50	5	0	-3	-20	3	-31	-2																		
606	3	3	1	1	4	50	8	19	10	1	20	2	0	30	-22	20	-20	31	31	32	30	30	-21	10	30	9	-10	30	0	20	30	10	-21	22	0	21	31	-2	0	22	
607	3	3	1	1	4	23	21	8	40	1	9	2	11	8	10	21	12	28	34	11	13	-12	17	13	30	15	-16	20	-33	24	16	5	15	-16	-21	24	-15	-26	25	-13	
608	3	3	2	2	3	24	0	71	0	1	21	2	20	20	20	20	21	20	23	20	20	25	7	0	0	12	0	0	11	1	12	5	16	16	10	18	8	24	15	7	
609	4	3	1	1	4	104	1	87	16	1	23	2		-6	-42	-46	-39	-36	10	-36	-23	-50	32	37	36	-30	35	7	-36	30	50	-25	37	4	-39	50	50	-50	50	46	
610	4	3	1	1	1	23	5	10	2	2		2		10	10	20	4	31	-10	11	10	-6	-5	-6	-9	10	-6	7	6	9	10	10	-2	6	5	-4	-3	6	-3	3	
611	3	3	1	1	3	15	0	70	40	1	10	2	10	0	0	20	50	50	25	-10	0	-20	-10	0	50	40	50	-50	-50	50	49	20	50	-50	-50	50	50	20	50	50	
612	3	3	2	2	4	11	50	8	90	1	20	2	-50	50	0	0	26	24	25	0	0	-36	24																		
613	2	2	3	3	1	50	50	91	10	1	31	2	-31	-50	-31	-20	31	10	10	-10	0	-50	-20																		
614	4	3	1	1	1	1	0	100	1	1	0	2	0	0	0	0	0	0	10	0	0	-20	0																		
615	4	4	1	1	1	3	0	1	2	2	-1	2	-1	1	1	2	1	1	13	13	8	6	2	2	5	9	4	4	5	-1	1	1	1	2	1	1	0	2	1	2	
616	3	3	2	3	4	7	3	100	29	1	33	2		-5	-6	-17	32	7	17	-10	46	-6	6																		
617	5	4	2	2	4	19	0	9	8	1	11	2	-50	0	0	0	0	0	0	0	0	0	0																		
618	3	3	2	2	4	72	0	100	4	1	31	2		-20	-31	-41	-10	-11	-10	-48	-4	-2	41																		
619	5	4	2	2	3	200	0	39	29	1	0	2	0	-11	-21	-11	19	50	10	-23	9	-41	40																		
620	3	3	1	1	2	8	19	9	9	1	11	2	10	10	50	50	50	50	50	7	7	10	15																		
621	2	1	1	1	3	200	50	1	100	1	50	2		-5	50	50	50	50	-50	-20	27	-21	16																		
622	2	2	1	1	3	12	100	4	30	1		1		-16	-30	-50	12	50	50	50	50	5	-7	-40	5	29	-29	-28	-27	38	19	-35	19	12	-48	28	27	-40	-21	-21	
623	3	3	1	1	2	13	3	5	1	1	30	2	-11	17	41	-10	-11	50	50	10	11	50	21																		
624	3	3	2	2	2	23	0	19	8	2	0	1	10	30	41	19	0	49	50	30	50	50	0																		
625	1	2	1	1	1	30	1	2	28	1	10	2		-50	-40	-40	-50	20	50	3	3	15	-10																		
626	3	3	2	2	1	8	2	9	8	1	-10	2		-4	-5	-3	8	-9	30	8	7	0	-3																		
627	5	5	2	2	4	78	0	75	25	1		2		-23	0	-39	50	50	41	39	43	3	-16																		
628	5	4	1	1	4	25	0	80	20	1	41	2	0	0	0	20	10	0	20	0	30	0	-20																		
629	4	4	2	2	4	24	50	9	10	1	20	2	-50	-50	-50	-50	10	50	50	50	50	30	-50	9	50	11	-50	-50	-50	20	50	-50	50	-50	-50	50	50	-50	50	50	
630	3	3	1	1	1	57	7	82	45	1	5	2		31	15	18	14	5	23	-18	20	-14	-25																		

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
0	50	41	0	50	31	0	50	50	-41	50	41	-50	50	30	0	20	20	50	41	30	30	-50	-40	50	0	0	0	10	0	0	0	0	0	0	0	0	0	0	10	
-50	50	30	-50	50	30	-50	50	50	50	50	-50	-50	30	50	50	50	50	50	-50	10	50	25	10	-50	50	50	-50	-50	50	50	-30	-30	-30	-30	-50	-50	50	50	-50	
20	-11	-10	10	-20	-21	40	0	0	0	0	0	0	0	0	20	0	0	40	40	40	-31	0	0	0	40	40	40	40	30	31	40	41	50	50	30	30	30	30	40	
-15	-11	-17	15	50	2	-2	50	-19	-46	-18	28	-16	21	-20	-39	-29	-17	15	-12	-6	1	16	22	-21	20	-13	-16	-25	-23	-11	-20	33	20	38	-25	-13	-17	25	31	
50	50	31	50	50	31	31	50	30	20	50	20	-21	50	50	50	21	45	41	27	30	44	-50	-20	-21	-6	50	4	5	50	37	50	32	21	7	6	21	50	-14	50	
-50	50	50	-50	50	50	-50	50	50	-50	50	50	-50	50	50	-50	50	50	50	50	50	50	-50	-50	50	-50	-50	-30	-30	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	
0	1	0	0	0	-1	0	0	0	0	-1	0	0	0	-1	0	0	0	0	0	0	0	0	-1	0	20	21	20	20	31	30	41	41	30	31	20	20	31	31	20	
0	50	40	0	50	50	0	50	50	0	50	-20	-50	50	20	-20	50	40	0	0	0	0	30	50	0	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	
1	21	30	4	20	20	0	0	30	0	40	31	0	19	32	0	30	28	10	31	21	0	-10	-10	20	21	20	9	10	0	-18	-22	-11	-22	12	0	0	-20	-17	-11	
-16	21	15	-12	26	17	-13	19	-17	-19	29	-16	-17	18	10	-9	19	9	5	21	12	-11	18	5	-11	-17	14	-19	-18	-20	-23	-22	-21	-22	-21	18	11	-19	10	18	
19	7	12	-7	23	-12	14	-12	-8	16	13	-5	10	-6	0	7	10	-10	6	-7	10	2	7	-11	11	4	7	-4	20	15	-2	14	-11	30	21	18	18	13	7	2	
-45	42	48	-31	50	50	-50	33	26	-28	36	28	-48	32	26	35	-23	-23	26	-13	-11	20	16	18	-25	9	-14	21	-20	-41	-24	20	-6	33	32	-34	19	-23	-27	-27	
6	2	-3	4	-4	4	-5	-3	5	-3	-3	13	-3	-3	4	-3	3	-3	6	-1	2	-3	7	-3	5																
10	50	30	-10	50	20	-50	40	40	-50	50	-50	-50	40	30	-20	0	10	10	0	0	0	-31	-31	10	10	20	10	0	30	-10	-50	-50	-20	-50	-50	-40	0	0	20	
																			</																					

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
631	4	4	2	2	4	47	0	45	8	1	31	2	-10	-11	-10	-10	40	40	40	30	50	30	11																		
632	5	5	1	1	3	49	19	19	9	1	41	2	-30	-21	21	21	21	30	-10	30	31	20	10	10	20	41	-50	-50	-50	50	50	50	-50	-50	-50	50	50	50	10	10	
633	3	3	1	1	2	52	0	100	49	1	20	2		-21	0	0	20	50	30	-1	-1	-21	-11																		
634	4	3	1	2	0	36	25	8	10	2	15	2	15	15	21	22	11	31	50	22	18	16	26	15	16	22	9	22	38	8	19	38	8	22	37	9	20	35	11	34	
635	3	3	1	1	2	111	0	24	50	1	25	2		0	0	-10	10	20	10	10	0	-10	-20																		
636	2	8	1	1	1	50	5	25	70	1	25	2	-25	0	5	-25	25	50	10	-50	-10	-50	50	25	-50	50	-50	-50	50	-25	-25	50	-50	-50	-50	-50	-50	25	-50	-50	

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
10	10	10	10	10	10	10	50	50	50	-50	-50	-50	20	20	20	50	50	50	-31	-31	-31	-50	-50	-50																
45	7	22	35	7	20	41	5	17	29	6	19	31	13	28	50	5	18	31	6	21	42	5	21	32	9	20	49	35	19	38	19	35	22	31	31	25	29	32	26	
50	-25	-25	25	-28	7	26	-9	-17	20	-8	7	-9	-6	-15	29	-22	-31	-20	-13	50	-10	27	-18	-15																

81	82	83	84	85	86	87
24	25	28	19	18	19	21

