Marketing orientation and its impact on product development in the Scottish software industry.

Alistair Cuthbert  Spektra Systems Limited, Livingston, Scotland
John Thomson  Napier University Business School, Edinburgh, Scotland

Abstract

In this paper, the authors discuss and evaluate marketing orientation and its impact on product development in the Scottish software industry. Spektra Systems Limited is used as a case in point. The authors carry out a wide literature review encompassing current strategic marketing theory on marketing orientation and new product development in small high-technology firms. This is tested using primary research carried out in Scotland between 1997 and 1999.

Introduction

The concepts of marketing orientation and product development in themselves are not new. The latter has received widespread treatment by a succession of marketers both academic and practising with a tendency to focus predominantly on consumer marketing. This paper aims to redress the balance; in particular, the relevant marketing issues and concepts in the context of a small to medium sized Scottish high-technology firm which provides specialist consultancy and bespoke development services within the global technology industry.

In 1991, Hugh Davidson and Dr Anthony J F O'Reilly wrote their collaborative text on Offensive Marketing and at the time their thinking was innovative, linking theory with their own experiences in practice. In 1997, Hugh Davidson wrote a sequel called Even More Offensive Marketing which develops on the earlier thinking in the light of the experience of the 1980s and 1990s. His approach entitled POISE focuses on an organisation which uses offensive marketing producing above-average profits; being offensive in terms of having vision and the right attitude; of understanding and adopting a truly integrated marketing approach and developing a strategic perspective which is based on offensive business analysis with a distinct vision for the future thus enabling the organisation to develop clear winning strategies. Effective execution he argues is a combination of segmentation, brand development, new product and service development, communications, market research, pricing and channel marketing. The book encapsulates the principles of successful marketing but also demonstrates that attitudes and practises towards marketing, competition and planning are in the main sadly lacking in many organisations. Another writer (Piercy, 1997) endorses these sentiments and his own book Market-Led Strategic Change attracted the following comment from Sir John Harvey-Jones.
"There are too many books on marketing theory and too few on how to change the culture of a company to make it market responsive. Nigel Piercy’s book is pragmatic and has the whiff of battle and the real world about it."

The aim of this paper is to identify pertinent marketing theory which can be applied to business to business marketing in the context of product development coupled with a strong element of commercial sense based on the managerial experience of both authors using Spektra Systems Limited (Spektra) as a case in point. The intent being to identify effective practical applications of theories in marketing orientation, innovation and product development for Scottish software consultancy service companies.

Methodology

The authors have approached this study according to Yin (1994) using Spektra as a case study. Both authors have been actively involved with Spektra for the past two years. Alistair Cuthbert is employed as the Business Development Manager and John Thomson has been engaged as an external marketing consultant and advisor based on a Teaching Company Scheme partnership between Spektra, Napier University Business School and the Teaching Company Directorate which is a Government sponsored programme to assist in the development of small high-technology companies.

To give validity they have developed a plan and audit trail to ensure that the findings will result from convergent data with no rival explanations. The sources discussed below were used to establish a triangulation of feedback and to corroborate findings.

Participant observation, documentary evidence, archive records, structured questionnaires and interviews have provided the authors with a rich body of evidence to be utilised in the study. Spektra possesses highly developed electronic business systems which allows access to a good level of electronic documentary information. Co-authorship has introduced the necessary degree of objectivity in that only one of the authors is employed as a member of staff thus removing a potential area of bias.

An audit trail using all paper and electronic based information within the company regarding New Product Development (NPD) was established. This information was compared to primary research which included open-ended structured questionnaires completed by staff who had been key in the NPD projects since 1996: in total, 14 individuals from a total staff of 27 personnel (52%). The findings were confirmed using a structured interview of 30 to 60 minutes duration. In 1997, the company also gained the support of a group of Master of Business Administration (MBA) students from Edinburgh University Management School (EUMS) to investigate the behaviour and attitude of decision makers in the Finance sector in Scotland. In addition, a survey questionnaire was utilised at a Company Workshop of invited industry influencers on 25 March 1999 to launch Spektra as Scotland’s Sun Authorised Java Centre (AJC). Forty five people attended the launch and 26 responded to the questionnaire. Although the sample was small and the attendees were by invitation, the respondents were self-selected from within target organisations. Of those who attended, 58 per cent completed the questionnaire and this gives validity to the findings and provided the authors with informed feedback on the company’s profile and the future needs of respondents. Finally, the company agreed to act as the focus of the Case Study Analysis (Agency


Page 2 of 25
Project Examination for the Institute of Direct Marketing (IDM) in Scotland. The study involved the professional students analysing the company, its market, competitors and customers culminating in a formal presentation of their suggested strategic direct marketing plan for Spektra. This was delivered in April 1999.

Entrepreneurial Nature Of Small High-Technology Companies

Small high-technology firms such as Spektra have attracted a great deal of attention since the early 1970s by both Government and researchers reflecting their important role as a catalyst for industrial innovation; particularly, in developed and oftentimes mature markets such as the UK. In the UK as a whole and Scotland in particular, small high-technology firms support the current Government’s policy on job creation and innovation and this study is an example of a Teaching Company Programme.

Past Research

The research carried out by Rothwell and Zegveld (1982) reflected the importance of small high-technology firms in the 1970s, specifically, within the scientific and computer sectors. Their research revealed that in the UK 40 per cent of all identified industrial innovation stemmed from this sector. Phillips (1991) used a broader definition of job creation as a measure of innovation in the USA and he confirmed the earlier findings of Rothwell and Zegveld. His research estimated that in the period 1970 -1986 firms with less than 500 employees created nearly 40 per cent of all new jobs within the high-technology sector. The role of small high-technology firms as innovators and job creators appears to be well founded by research.

Past Research

It is less clear how small high-technology firms develop strategies for growth or, to be more precise, sustained growth. Studies by Rothwell and Zegveld (1982) and Oakey (1991) attempted to understand the entrepreneurial nature of these firms and the constraints to further growth. In doing so, these and other studies have tended to focus on entrepreneurial personality, organisational structure, individual and functional skills and the availability of finance. The achievement model of McClelland and Winters (1969) is complemented by Kets de Vries (1977) and Gupta (1984) who show the correlation between individual personality of the owner/partner/director and strategic decision making. Oakey (1991) concluded that many entrepreneurs showed traits of individualism and stubbornness.

Oakey was not intentionally being controversial or over-critical, he merely indicated a research-based observation. In terms of organisational development, the important relationship is between the goals of the entrepreneur and those of the organisation. It appears that a time will come in the life cycle of a firm when there is a need to shift from an entrepreneurial to a “professional” management style. Greiner (1972) related it to the “stages of growth” model but one could argue that this is contradictory to more recent research by Slevin and Covin (1990) indicating that larger firms need to become more entrepreneurial. Nevertheless, there is clear evidence in recent studies by Brock and Evans (1989), Pavia (1991) and John and Rowntrees (1991) that smaller firms need to adopt a more formalised approach to strategic planning, monitoring and control if they are to achieve sustained growth. A more formalised and systematic approach to future development need not constrain the entrepreneurial nature of small high-
technology firms but a shortage or limited access to finance will. Sector dynamics and the high risk nature of new technology development would indicate a collaborative approach to future development within small high-technology firms. It also indicates the need for Government support if this seedbed of innovation and job creation is to bear long-term fruit which in turn will help to sustain the continued growth of the host economy.

The Marketing Concept

Traditional marketing concepts appear to have limited value when applied to small high-technology firms and their sustained growth. Fortunately, there have been studies carried out on industrial and services firms seeking growth. Berry (1982) in America and Gummerson (1987) in Scandinavia concentrated on the development of internal organisational processes with the specific goal of building stronger customer loyalty through relationship marketing. This new marketing approach moves small high-technology firms from managing transactions to a greater focus on building long-lasting customer relationships as proposed by Webster (1982). In doing so, it allows a small firm to have a greater chance of survival and growth in a highly competitive and rapidly changing environment.

Hakansson and Snehota (1989) carried out a study in Scandinavia on the subject of building stronger customer loyalty and concluded that the key "actors" in a marketing system showed a preference for creating "networks" in which common goals are achieved through relationships based on co-operation and not confrontation. Subsequently, there have been studies in other parts of the world which have also identified a collaborative approach to managing a market system for growth. Collins and Doorley (1991) highlighted the Keiretsus in Japan where large firms or industrial groups are configured and co-ordinated to allow independent elements to co-operate with each other to develop systems to share skills and resources to achieve sustainable competitive advantage in global markets.

Networking appears to have greatest credence in research carried out for the small business sector. It seems to suggest that networking allows small firms to achieve both economies of scale and scope thus placing them in a stronger position to compete more effectively with larger competitors. Dubini and Aldrich (1991) and Carson et al (1995) go further in that they introduce the concept of Personal Contact Networks (PCNs). PCNs can be formal or informal co-operative relationships which allow owners / partners / directors to build links with others in their market with the aim of obtaining information and knowledge to be able to optimise growth opportunities and operational performance.

The Marketing Process

The authors have suggested that traditional marketing concepts are of limited use in the context of small high-technology firms and Gronroos (1994) shares this view. However, this does not imply the outright rejection of the "4Ps" or indeed the "7Ps".akin to Nevin (1994), the authors share the view that small high-technology firms need to adopt twin strategies covering customers seeking a standardised, generic product package using the "7Ps" and a more flexible and tailored offering which requires the firm to

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build strong relationships with key targeted customers. It does require a balance between
closer customer relationships and the cost / benefit of sustaining closer relationships as
part of a growth strategy for small high-technology firms. This move from transaction
marketing to customer-supplier relationships requires a different marketing process
within the firm. A key development in this thinking was the summary of research-to-
date presented by Hills and LaForge (1992). They concluded that there appeared to be
four key factors of successful entrepreneurship, namely, organisation creation,
innovation, uniqueness and growth. All of these have a distinct relevance to the exact
nature of the marketing management process within small high-technology firms
deemed to be entrepreneurial in style.

Tempering any discussion on a properly constituted marketing process within small
high-technology firms is a view that marketing within the small firm could be said to be
an integral part of managing in an entrepreneurial environment. This entrepreneurial
marketing philosophy stems from the perceived constraints that make small firms
uniquely different as outlined by Birley (1982); namely, goals not based on analysis of
opportunity, but determined by the actions which appeal to the owner / partner / director,
a lack of resources and / or knowledge which preclude decision-making based on the
classic strategic marketing approach of analysing markets, selecting a long-term growth
strategy and optimal management of a detailed plan. Carson (1985) adds two more
constraints; namely, lack of general management experience and a limited customer
base. It is argued that these constraints influence the marketing processes employed by
the owner / partner / director in small firms.

\[
\begin{array}{c|c|c|c|c}
\text{HIGH} & \text{ENTREPRENEURIAL-} & \text{ENTREPRENEURIAL-} \\
\text{ENTREPRENEURIAL-} & \text{TRANSACTIONAL} & \text{TRANSACTIONAL} \\
\text{ORIENTATION} & \text{STYLE HI-TECH} & \text{STYLE HI-TECH} \\
\text{LOW} & \text{CONSERVATIVE-} & \text{CONSERVATIVE-} \\
\text{TRANSACTIONAL} & \text{STYLE HI-TECH} & \text{STYLE HI-TECH} \\
\end{array}
\]

\[
\begin{array}{c|c|c|c|c}
\text{LOW} & \text{HIGH} & \text{CLOSENESS TO CUSTOMER ORIENTATION} \\
\end{array}
\]

**Figure 1. Alternative Marketing Style Matrix**

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Chaston (1998) has carried out a detailed study by mail survey on whether orientation of small high-technology firms influences overall performance and the level of internal organisational competencies in the key areas of innovation, human resources, employee productivity and decision-making. He proposes a two dimensional model which focuses on two critical aspects which influence marketing strategy; namely, closeness to customer and level of entrepreneurial activity. His suggested matrix is shown in Figure 1 and he suggests that there could be four alternative marketing styles:

Chaston attempts to move away from a single purist philosophy to a hybrid model which allows him to consider whether there may exist a number of alternative marketing styles which might be appropriate to small firms depending on the prevailing customer-supplier relations. He categorises his four alternative marketing styles as follows:

1. **Conservative-transactional style.** These firms operate in markets where the customer is seeking standard specification goods or services at a competitive price and has little interest in building a close relationship with suppliers (e.g. standard specification computers).

2. **Conservative-relationship style.** These firms operate in markets where the customer is seeking standard specification goods or services but is willing to work closely with suppliers to optimise quality and/or obtain mutual benefits from creating more effective procurement and delivery systems (e.g. electronic components for J.I.T./T.Q.M. manufacturing operations).

3. **Entrepreneurial-transactional style.** These firms operate in markets where customers are seeking innovative products or services which can be procured without forming a close relationship with suppliers (e.g. software houses using direct mail to market low cost, customised spreadsheet packages which solve sector specific management accounting problems).

4. **Entrepreneurial-relationship style.** These firms operate in markets where customers work in partnership with suppliers to develop innovative new products or services (e.g. producers of low volume, customised microprocessors utilised by specialist machine tool manufacturers).

The results of the survey using the measurement tool of revenue growth indicated that an entrepreneurial-relationship orientation will enhance overall performance of small high-technology firms. The survey also suggests that as entrepreneurial high-technology firms move closer to customers they exhibit higher competencies in areas such as human resources, employee productivity, management of quality and utilisation of information in decision-making. The study concludes that as entrepreneurial and relationship marketing can enhance performance, it is up to the owner/partner/director to select the appropriate orientation style to satisfy the degree of closeness sought by customers/suppliers and the firm’s vision of innovation as a strategy for delivering customer satisfaction and sustained growth.

**New Product Development Process**

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Research carried out by Cooper (1988) provides evidence that firms who have a systematic, step-by-step new product process and decision-making guide for new products are far more likely to see a significant payoff in terms of the success rate of their new product development process. The classical NPD process remains extant and no one activity is pivotal, all stages provide the underpinning necessary to determine the suitability or otherwise of a new idea. More successful projects were defined by better (quality) execution of activities; particularly, the up-front or early activities in the NPD process according to Cooper (1988) and Johne and Snelson (1988). Success was adjudged to be based on short payback periods, project profitability, meeting sales and profit objectives, relative sales and profits, market share in both the home and overseas markets. The lessons from the above research confirmed the need for a more formal and systematic approach to NPD with particular focus on the completeness of the process, the quality of executing the process and the added importance of the up-front or early activities.

Johne and Snelson (1998) concluded that the less successful firms tended not to be market-led but more functionally driven resulting in no clear vision or strategy. Their approach to R&D did not differentiate between modifications / enhancements and pure R&D and new products. This led to stagnation and a tendency to grow by acquisition as opposed to organic growth. Leading firms on the other hand appeared to harness the support of top management at an early stage thus securing not just management commitment but also financial and development resources. An executive champion is often cited within small firms as a positive asset in terms of resource allocation, priority, communication and ongoing support and commitment. Cooper (1988) suggests that successful product developers spend on average 20% per cent of their total innovation budget on the NPD stages prior to the development stage and Japanese firms spend even more.

High-technology firms are ever mindful of the shortening product life cycles and the need to compress the innovation process to minimise the risk and achieve an acceptable return on investment within the required payback period. Cooper (1988) identified this dilemma between the need to compress the period of innovation and the commercial imperative of ‘getting it right’. Truncating the process is risky and therefore a parallel process as opposed to a series approach is advocated. This means that tasks are less likely to be overlooked due to time constraints, there is no ‘dead time’ between handovers from group to group and most importantly, the entire process becomes multifunctional and multi-disciplinary resulting in a fully integrated process and development team.

Firms which are actively involved in product innovation according to Johne and Snelson (1988) normally expect marketing to take the lead in identifying new product ideas and only thereafter will the firms assemble a multi-dimensional team to develop the envisioned product. The assembly of a team is expensive and should be structured to suit the type of project and where possible should include customers and suppliers. Schilling and Hill (1998) identified two types of teams in firms, namely, lightweight and heavyweight. The lightweight team has a project manager, liaison person and key team members who remain with their division function and periodically spend part of their time on the project. The heavyweight team is led by a project manager who is a senior executive with power and influence to allocate resources and who assembles around him...
or her a full-time project team which is autonomous to the functions within the firm. The project manager will in all probability have the necessary skills in engineering and marketing. Responsibility for the career development of the members of the team will rest with the team leader and the project and not with functional management. He / she will be responsible for ensuring a clear focus and commitment to achieve the goal of the project within the given resources and timescale. This type of team is prevalent when the outcome might be the creation of a new business.

Product Development in a Technological Environment

It was highlighted earlier that small high-technology firms operate in a dynamic, rapidly changing and highly competitive environment. This is an international phenomena and is not unique to the UK or Scotland. The marketing task therefore is to continue to meet changing customer needs at the same time as reducing time to market for new products. New Product Development (NPD) in the high-technology industry faces an ever-increasing pace of change due to improved and developing technologies and the increase in competition at a time of expanding consumer demand for wider choice and increased added-value. Schilling and Hill (1998) have concluded that high-technology firms rely on the products introduced in the last five years for more than 50 per cent of their annual sales. It is also worth remembering that many NPD projects never reach the market and of those that do, only 40 to 67 per cent according to Schilling and Hill will generate an acceptable return on investment. Their review of the NPD process provides us with unanimity which can act as a focus for owners / partners / directors to improve their NPD process.

Published sources including Johne and Snelson (1988) stress the responsibility of top management to set broad goals for innovation and their essential role in “envisioning, energising and enabling the innovation programme” within their firm. Schilling and Hill refer to this as the technology strategy aimed at identifying, developing and nurturing those technologies that will be crucial for the long-run competitive position of the firm. The selected technologies must create value for customers thus matching current and future customer needs thereby justifying marketing’s role in the new product development process to envision and explore new product opportunities.

Innovation in high-technology small firms relies on a collection of inter-related functions and processes vested in key individuals or multi-discipline teams. Communication and cross-fertilisation between individuals and teams would appear to be essential and a routine part of the NPD process. This process would highlight customer needs; satisfaction, technological, resource or skill gaps thus allowing for targeted investment which would reduce waste and improve the company’s overall strategic fit. Managing the product life cycle and the firm’s product portfolio by using the Ansoff Matrix, the Boston Consulting Group Matrix and the Shell Directional Policy Matrix will increase awareness of cash usage and cash generation of existing product offerings but it will not stimulate pure Research & Development; be it, breakthrough, platform or derivative technologies or products.

Johne and Snelson (1988) make the key distinction between developing old products (greater market penetration or market development) and new products (product development or diversification). They suggest that NPD needs its own Ansoff and

Directional Policy Matrix to allow managers to assess in a balanced way their portfolio of research projects. By doing so, they firmly believe that managers will be able to evaluate the varying degrees of risk between ongoing development of existing products and the development of new products. Davidson (1997) argues that new products should 'fit' the customer needs and expectations, should add extra value and be clearly differentiated. This is not new but it does reflect the requirement to offer a superior mix of performance and price to ensure a successful launch and to produce the firm platform to sustain competitive advantage.

**Technology Adoption Life Cycle Model**

Moore (1998) has produced a highly focused text book on the development of marketing strategies based on his experience in Silicon Valley, USA. He offers an alternative view of the Technology Adoption Life Cycle Model which was developed out of social research in the late 1950s about how communities respond to discontinuous innovation. Discontinuous innovation relates to a new product or service which dramatically shifts the benefits or level of benefit to the consumer. His revised model can be seen at Figure 2 below:

![Figure 2. The Landscape of the Technology Adoption Life Cycle](image)

The model helps to explain why marketing communications attracts such enthusiastic responses from some customers and lukewarm responses from others. Moore (1998) attempts to define the various customer types as follows:

1. **Technology Enthusiasts.** This type of customer is committed to new technology and gaining access to the latest and best innovation. They have been crudely defined in practice as "techies" who, in a business to business context have influence but not money. They are the gatekeepers to the rest of the life cycle. The key to success is their endorsement for wider release.

2. **Visionaries.** These are the true revolutionaries in a business who want to be first to exploit a new capability to give competitive advantage. Their true influence is the ability to attract money to purchase the technology to achieve their vision. They provide seed funding and exposure on behalf of the new

In McLoughlin, Damien, and C. Horan (eds.), *Proceedings of the 15th Annual IMP Conference*, University College, Dublin 1999
technology. They tend to be demanding in the sense that they want a tailored solution which is exclusive to them.

(3) **Pragmatists.** The pragmatists recognise the benefits of new technology to improve systems and processes. They require proven effectiveness and reassurance through references from trusted friends, colleagues or business acquaintances. They are looking for reliability and a proven track record and naturally this tends to favour the market leader as a preferred vendor.

(4) **Conservatives.** Conservatives are reactive, price sensitive, sceptical and often demanding. Unwillingness to pay affects the level of service provision that is provided. This is a largely untapped market which looks for simplified and commoditised systems which satisfy their limited needs.

(5) **Sceptics.** These are the true protagonists who deny the value of high technology or its relevance to them. In practice, they de-select themselves from the buying process.

Linked together, the five customer types outlined above provided the basis for developing a high-technology marketing strategy in the 1980s but although logical it rarely worked in practice. It appeared that a chasm divided the visionaries from the pragmatists. The visionaries demonstrating blind but enlightened faith and the pragmatists disbelief without tangible evidence. In life cycle terms, real success is achieved once a product/service has been accepted in the mainstream market which encompasses both the pragmatists and the conservatives. Moore (1998) suggests that the bridge to success is delivery of the whole product.

> the whole product is defined as the minimum set of products and services necessary to ensure that the target customer will achieve his or her compelling reason to buy

He contends that the key to a winning strategy is to identify a single beachhead of pragmatist customers in a mainstream market segment and to accelerate the formation of 100 per cent of the whole product. In other words, establish a niche foothold in the mainstream as soon as possible.

The published literature reporting the results of empirical studies is unequivocal about the contribution of both marketing and top management in small firms to the successful development of superior products. Johnes and Snellson (1988) found that leading firms in NPD exhibited a market-led approach, based on careful prior analysis of market opportunities as perceived by all the key functional specialists and not solely those envisioned by the head of the marketing function. Less active product innovator firms were functionally-led by, for example, the technical department. In the less successful firms with marketing departments, these tended to be pure sales functions without the skills to provide vision and market prediction. This was evident at both top management and marketing level within these organisations. In the computer and software industries time to market is crucial and product life cycles can be as short as 12 months allowing little time to prepare for the next generation of product or to achieve an acceptable return on investment for existing products. Market orientation and effective marketing...
processes to be able to deal with rapid technological change appear to be an essential prerequisite for success in this industry.

NPD Strategies for Small High-Technology Firms

While there is a consensus in the published literature as to ‘best practice’ in NPD across industries, there has been little specific research on firms in the high-technology industry. Bruce (1988) highlights the rapid change and the high levels of risk and uncertainty as being the context for NPD in such firms. Developing a market focus is not clear-cut as ‘no one knows for sure’ the potential market opportunities. Similarly, Johne and Snelson (1988) illustrate how technically-led firms in the high-technology industry often ask marketing specialists to conduct market research for totally new products, when existing techniques for research are often inappropriate for products which the customer finds difficult to conceptualise. Results are consequently unsatisfactory in the majority of cases.

Bruce (1988) concludes that successful firms are likely to work with ‘progressive’ customers, given that there is little knowledge of future product specification and market or technology development. This uncertainty is a key feature of leading edge technology markets and with it goes a vast amount of experimentation, testing and evaluation of different standards, prototypes and applications by both suppliers and potential users. Furthermore, forecasts of the future potential patterns of market development is highly speculative according to Bruce (1988). This makes for a difficult strategic planning process, as ‘the underlying assumption of strategic planning is founded on a clear vision of the future’. In this market, the competitive rules are constantly changing due to the absence of clearly defined opportunities.

To cope, firms need to develop strategies which are flexible, open-ended and explorative. They are typically represented by varying levels of contact with customers, suppliers and manufacturers to minimise risk and to optimise the opportunity for innovation and growth. One of the key ways of identifying new markets is through evolving collaboration between suppliers and progressive customers and other joint product development initiatives. These initiatives can come from the supplier or from the customer and the dynamic nature of this interaction is not adequately covered in existing theories or literature. Innovation is also encouraged through what is termed ‘sideways linkages’ with other suppliers and manufacturers. There remain differences between large and small firms in this industry. In the large firms there is a significant test-base of in-house users of new technology and in general a large customer base. This gives a degree of competitive advantage and makes them the natural choice for customers seeking the development of bespoke systems. Smaller firms tend to rely on seminars, training workshops and consultancy services to provide the necessary input and impetus to their new product development process.

Industry Overview

General

The National Software Strategy for Scotland provided the authors with a great deal of data regarding the software industry. The analysis carried out for the above study...
confirmed that world markets for software and services were expanding rapidly. The European market was expected to grow at the same pace as the global market whilst the UK could see growth above the European average. The study was not able to ascertain Scottish-specific data on markets but the current state analysis indicated that Scottish output had grown considerably over the last 10 years.

**Industry Analysis**

It is estimated that the UK computer services market was worth £11.3 billion in 1997, an increase of 14.2 per cent on 1996. That level of growth has been sustained to 1999 partly by the momentum within the industry but partly due to the millennium and European Monetary Union (EMU). The software industry in Scotland has grown to become a significant employer with 19,600 people involved in companies whose principal business is software and which generates an estimated £1.4 billion per annum. In growth terms, the software industry is outstripping the more traditional industries such as whisky and tourism.

The UK Computer Services Industry is very fragmented and consists of a proliferation of small companies with a number of large players (See Figure 3 below). Approximately, 49 per cent of the industry turnover is accounted for by the top 15 firms.

<table>
<thead>
<tr>
<th>Turnover Size (£000)</th>
<th>Number of Enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 49</td>
<td>21,170</td>
</tr>
<tr>
<td>50 - 99</td>
<td>16,915</td>
</tr>
<tr>
<td>100 - 249</td>
<td>5,225</td>
</tr>
<tr>
<td>250 - 499</td>
<td>2,165</td>
</tr>
<tr>
<td>500 - 999</td>
<td>1,370</td>
</tr>
<tr>
<td>1,000 - 4,999</td>
<td>1,210</td>
</tr>
<tr>
<td>5,000 +</td>
<td>310</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48,365</strong></td>
</tr>
</tbody>
</table>

*Figure 3: Size Distribution of UK Software Companies*

The level of competition in the industry is deemed to be high as demonstrated below using Porter’s Five Forces Model:

<table>
<thead>
<tr>
<th>Threat of Substitutes</th>
<th>Power of Suppliers</th>
<th>Competitive Rivalry</th>
<th>Power of Buyers</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>LOW MED</td>
<td>HIGH</td>
<td>HIGH</td>
</tr>
</tbody>
</table>

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In Scotland the software industry has exhibited significant growth in both employment and revenue over the past 5 years. In the short term, this is likely to continue due to the significant effort needed to address the “Year 2000” issues, and in managing the transition to a single currency. If the current growth was to be sustained for a further five to six years, software activity in Scotland could double in size. If one was to use the latest figures on the job market for the IT sector for the UK as a whole it indicates that growth in the market has stalled. The number of IT jobs advertised in the UK fell by more than 9 per cent from April to September 1998. However, the demand for Java developers has exhibited strong growth, with an increase of 179 per cent between January and June 1998. In addition, average pay increases in Scotland mirror those in the rest of the UK indicating equal demand for Java developers across the country.

There is critical mass in the Scottish software industry in certain vertical markets such as finance, oil and gas, and utilities. Figure 5 below shows the percentage of IT spend on an industry by industry basis for the UK as a whole.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Expenditure (£000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities</td>
<td>1,502</td>
</tr>
<tr>
<td>Finance</td>
<td>959</td>
</tr>
<tr>
<td>Public Administration</td>
<td>758</td>
</tr>
<tr>
<td>Retail/Distribution</td>
<td>451</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>343</td>
</tr>
<tr>
<td>Computer Services</td>
<td>286</td>
</tr>
<tr>
<td>Process Industry</td>
<td>199</td>
</tr>
<tr>
<td>Other Industry</td>
<td>154</td>
</tr>
<tr>
<td>Education/Research</td>
<td>57</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>588</strong></td>
</tr>
</tbody>
</table>

Figure 5: IT Spend per Installation by Industry (UK, 1996)

Research Findings

Industry

In particular, packaged software is becoming increasingly important in the software industry, this being tradable and more easily exportable whereas custom software development is a service and, thereby, more limited to domestic or local markets. The world packaged software market is large and is currently estimated at $102 billion. The European market for applications packages is expected to grow at 10 per cent per annum into the millennium.

Company Culture and Structure

_in McLoughlin, Damien. and C. Horan (eds.), Proceedings of The 15th Annual IMP Conference, University College, Dublin 1999_
Spektra was incorporated in April 1996 following a management buy-out from a Swiss multinational. The company represented the software development arm of the multinational and the directors of Spektra were formerly employed in this arm. As a divested company, Spektra was able to continue providing specialist consultancy and bespoke development services to its former owner and a number of predominantly ‘blue chip’ customers. The company has four directors and a total staff of 27 people based in Livingston, Scotland.

Fundamental to the company is its objective of continuous growth. The five year plan, which is up-dated and re-issued on an annual basis, includes the key financial targets of a minimum of 20 per cent growth in turnover per annum, whilst maintaining a gross profit of 20 per cent. In addition it is planned that product revenue will contribute increasing amounts to the company turnover. Allied to this objective is the concept of continuous improvement which is underpinned by Spektra’s electronic process system, and assisted by the enlightened use of ISO9001 / TickIT certification which the company has held since 1996.

The directors of Spektra actively encourage a culture of entrepreneurship and have developed a flexible organisational structure enabling them to create new ventures as and when necessary. The company adopts areas of best practice within its sector and it has a simple but flexible organisational structure which allows it to evolve as necessary to meet the needs of a rapidly changing environment. The electronic process system is fundamental to the way the organisation operates since it provides an integrated framework for communicating and sharing information throughout the company. The system is tailored specifically to Spektra’s current business needs, is accessible by every employee, and encourages and supports continuous process improvement. Linked to this is the strong belief in personal development. In 1997, the company was accredited as an Investor In People (I.I.P.) and being based in the Lothian Region of Scotland was adjudged to be Lothian Company of the Year for 1998. The current company structure can be see in Figure 6 below:

![Organisational Structure](image)

*Figure 6: Organisational Structure*

In McLoughlin, Damien. and C. Horan (eds.), *Proceedings of The 15th Annual IMP Conference*, University College, Dublin 1999
Unusually for a MBO, Spektra was not founded to serve any clearly identified market niche. On the contrary, the company is typical of many small companies who seize an unexpected opportunity at a moment in time. In this case, the Directors were offered the opportunity to develop an established operation independently from the parent group. As part of the MBO, the company was granted “a period of grace” with guaranteed income streams to allow the new company to establish itself and gain new business in its own right. The company’s competitive advantage lay in the areas of software development processes and adoption combined with business analysis of new and emerging technologies.

It is three years since the company was founded and in this period, Spektra has specialised in the technologies which it offers as opposed to focusing on a particular vertical market. The company provides specialist consultancy and bespoke development services through its two operational divisions; namely, Division A and Division B. These divisions are separate profit centres based on their respective technology expertise; Java / Object Oriented Technology and Lotus Notes. Nevertheless, each division aims to sell business solutions, with technology being the enabler.

No ‘shrink-wrapped’ products are sold direct by the company at present but the company does possess the Intellectual Property Rights for one product currently on the market and it acts as a reseller for certain Lotus products. It has also developed in partnership an electronic version of a product produced in book form. The company specialises in electronic commerce (e-commerce) and its current portfolio includes services in business analysis, systems architecture, bespoke application design and development and technology transfer. Solutions range from stand-alone CD ROM based applications to multi-user, multi-site shared applications.

The two divisions currently operate as separate profit centres. Division A, the original technical focus of the company, represents 89 per cent of company turnover with a staff of twenty; whereas Division B, a newly set-up branch with a separate technology focus and a staff of seven, currently represents 11 per cent of company turnover. A company profile can be found at Figure 7 below:

<table>
<thead>
<tr>
<th>Division</th>
<th>Staff Nos.</th>
<th>Turnover %</th>
<th>Industry Sectors</th>
</tr>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Computer Services</td>
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<td>Financial Services</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Public Services</td>
</tr>
<tr>
<td>Division A</td>
<td>20</td>
<td>89</td>
<td>Yes</td>
</tr>
<tr>
<td>Division B</td>
<td>7</td>
<td>11</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Figure 7: Spektra Company Profile

New business acquisition and new product development are imbedded in the culture of Spektra. Historically, both divisions have relied heavily on networking as the key driver for new business creation. Division A attracted 83.5 per cent of new business in this way. 

and Division B attracted 65.6 per cent of new business by networking. Most of Spektra’s business emanates from large companies and is currently highly focused on the Scottish market.

The evidence produced by the Staff Survey, Company Workshop Survey and the IDM Study indicate that this could well be changing as a result of the company’s stage of development.

Initially, Spektra relied for new business primarily on networking and referrals. The process of networking began before the company was incorporated through the involvement of the current directors with the Scottish Software Federation (SSF), local councils, committees and business forums. This approach did bear fruit and was deemed to be moderately successful; however, it was unfocused and did not provide a structured process for developing new products or new business. Neither did it add to the existing reputation of Spektra within the business community of the East of Scotland. The awareness of the company and the nature of its business remained low and this was confirmed by primary market research carried out in 1997 using IT decision makers in the finance industry (EUMS, 1997).

University of Edinburgh Management School

This primary research was undertaken by MBA students to ascertain the buying habits of IT managers in the Scottish finance industry. Although not statistically significant, this study backs up observations by staff at Spektra and other findings of this paper. Based on telephone and personal interviews of 30 minutes duration with 15 IT decision makers, it concluded that the key to purchasing decisions is the relationship between the buyer and the supplier. Further, when seeking new services, managers will choose new suppliers based on advocacy and referral from their peers, either in their own organisations or in competitor companies.

Authorised Java Centre Workshop

A workshop was held at Spektra on 25th March 1999 to launch the company as the Authorised Java Centre in Scotland. The workshop hosted 45 personnel from carefully selected target organisations in Scotland who in turn self-selected the appropriate individuals to attend. Of those who attended, 26 (58%) completed the questionnaire providing feedback on the company’s profile within Scotland and the envisaged future needs of the guest organisations.

The questionnaire was constructed to gain information on the following key areas.

1) **How did they find out about Spektra?** In the majority of cases this was by word-of-mouth (72%), personal contact (8%), mailshot (8%) and Other (12%). This confirms the practice of personal contact and the company’s practice of networking.

2) **Respondents to the Questionnaire** The following industries were represented, namely, IT (22%), Utilities (12%), Professional Services (12%).

*in McLaughlin, Damien. and C. Horan (eds.), Proceedings of The 15th Annual IMP Conference, University College, Dublin 1999*
Consultancy (11%), Finance (11%), Industrial (8%), Retail (8%), Telecommunications (8%) and Other (8%).

(3) Services offered by Spektra. Respondents indicated that the following Spektra services were most relevant to their organisation, namely, Application Design (24%), Software Development Process Consultancy (22%), Architecture Design (15%), Support and Technology Transfer (15%), Business Analysis (15%) and Other (9%). Interestingly, there were two areas where there was an underprovision; namely, business analysis and technology transfer and one area of overprovision, bespoke development. In summary, over half of the envisaged services are made up of software process consulting, business analysis and technology transfer.

(4) Value of the Workshop. All respondents valued the workshop and felt that an e-mail newsletter plus periodic seminars were the optimal platforms for communication and updates on future development.

Staff Survey

An internal survey was carried out using all key NPD staff and incorporating all new projects since 1996. In total, 14 members of staff (50%) participated in this study which consisted of an open-ended structured questionnaire followed by a structured interview of between 30 and 60 minutes duration.

Since 1996 there have been 7 significant NPD projects, for which at least a prototype was developed or formal market research was carried out. Of these, 1 is now being sold through a partner company, 1 is being used internally 2 have reached prototype stage and 3 are still at the research stage.

Although there was a lot of encouragement from top management to be entrepreneurial, there was no evidence of a formally managed NPD process, other than an adopted methodology for progressing concepts to prototypes to products. This was incorporated into the electronic administration system but has since been abandoned owing to its bureaucratic nature. Product ideas were encouraged at all times and from all sides, with guidelines solely based on the type of technology used, and as a consequence projects ranged from games to software tools to a medical imaging product. One project in particular followed closely the established guidelines for NPD, and in so doing qualified for external funding.

Once established, all projects had a champion, however only 2 of these were led by a board member, the others being led by members of staff. Investment was made in terms of time spent in development for all projects, 3 in employees’ spare time and 4 in the company’s time. For 3 of these 4 projects however, most or all of the costs were recouped by advance-royalty payments from a development partner or from a government-sponsored development grant.

Since the paper was drafted the company has begun to look towards ‘productising’ software that has been developed for customers. This would address certain criteria, such as strategic fit, formal development process and project champion, however it

in McLoughlin, Damien. and C. Horan (eds.), Proceedings of The 15th Annual IMP Conference, University College, Dublin 1999
would also represent a low risk approach to prototype development. It is too early for this study to ascertain the effectiveness of this approach, however no plans have yet been made as to how the product would be further developed after the delivery to the initial customer.

IDM Study

The students registered for the Institute of Direct Marketing postgraduate diploma undertook a live case study on Spektra. This constituted one of their main examinations where their task was to analyse the company, its market/s, competitors and customers to help them develop a strategic direct marketing plan for the company. Four syndicates undertook the task culminating in a formal presentation to the company and examiners from Napier University Business School.

All four syndicates confirmed that Spektra had been relatively successful to-date based on its unique skills and expertise. They recommended a more structured approach to marketing with greater focus on customers and market development. The strategic platform would encompass both divisions which would appear seamless to customers. Success would be derived from building customer relationships, partnerships and possibly collaborative arrangements with other companies where a strong linkage and strategic fit could be identified. Strategic alliances and partnerships with customers, suppliers and other providers appears to offer the company the best route for growth in this industry sector.

Strategic Platform

The dynamic nature of small high-technology firms and the ever-increasing pace of change within the industry requires a strategic platform on which to build future success. The Strategic Platform (IDM, 1999) approach to business development has been used in the Financial Services Industry. It encapsulates all accumulated efforts and activity which contribute to future results. Figure 8 below shows the building blocks for the strategic platform:

![Diagram of Strategic Platform]

*in McLoughlin, Damien. and C. Horan (eds.). *Proceedings of The 15th Annual IMP Conference,* University College, Dublin 1999*
The Market Platform is defined in terms of the identification of key target audiences who have yet to be contacted and thereby allowing the company to develop the Working Platform where there is the opportunity to create and communicate the value of your company / products / services to key target prospects who have as yet not purchased from the company. The Buying Platform is the ultimate level where purchases can actually be made by first time buyers and repeat sales from existing customers. The model highlights the need to view transactions not as discrete events, but something that transpires over time, and provides a basis for future exchange / lifetime value. There are exchanges other than for money taking place in the development of the strategic platform.

**Market Platform**

The key driving force for a successful market platform is intelligence and information in a number of key areas which help marketing managers to plan properly for the future:

- Who is buying?
- What are they buying?
- What is the company’s share of their expenditure?
- How do they prefer to be managed and communicated with?

To add value to the process, information has to be used effectively and efficiently. Through technology business knowledge is easily transferable and therefore it is the speed and the way in which it is used which can generate significant competitive advantage. Access to the information is not sufficient by itself as it does not explain entirely the dynamics / culture of an organisation, or of the individuals who work within it. The Customer Value Cube (IDM, 1999) is a traditional technique which has been developed to identify strategies for current customers, and for developing profiles of new prospects. The aim being to identify ways of moving customers into the high current value and high potential value cube in the bottom right.
Potential Additional Value

Low  High

Low  ?

Current Value

High  Maintain

Nurture

Figure 9. Customer Value Cube

It also helps identify customers with low current value but with potential for high future value. Not all customers within each of the value groups are the same, some will come from different organisations, industries or indeed be different in their outlook. The Customer Value Cube is perhaps over-simplistic and further detailed work on segmentation techniques will be necessary to provide a more accurate model for identifying suitable profiles of target customers.

Working Platform

The Working Platform provides the seedbed of customer acquisition. The key task is to concentrate resources on the market segments offering the greatest potential. It would be measured in terms of response, conversion and value of business generated. A number of issues would need to be considered:

* the degree of competition for customers within each segment;
* the company’s ability to compete effectively;
* how readily and clearly the actual contacts within the company can be identified and targeted;
* the likelihood of being able to do business within an appropriate time;
* whether the value of business generated is sufficient and profitable bearing in mind the lifetime value of a prospect as opposed to an immediate project value; and,
* the allowable cost for generating business in each segment.

To assist in this difficult marketing task, the company could adopt the Customer Acquisition Matrix (IDM 1999) to facilitate strategic thinking on product/service and segmentation. The matrix can be enhanced by making it three dimensional which allows the user to consider communication channels.
In combination, the data and analysis will help to determine the costs and benefits of targeting new customer segments as well as planning for an acceptable level of response.

**Buying Platform**

The Buying Platform relies on all accumulated efforts and activity contributing to future results. The need to be business focused is not in dispute but it does mean that everyone within the company needs to become more customer focused and everyone involved in communication with the customer needs to adopt a consultative approach to sales. A strong Buying Platform is one on which customers continue to buy for as long as possible and nothing is more powerful at building relationships than personal contact. Customer acquisition and retention are essential ingredients for a strong Buying Platform and the success and profitability of the company.

**CONCLUSIONS**

In conclusion, the authors have identified the need for greater marketing orientation, customer focus and a more structured process to identify new product/service opportunities and their route to commercialisation. From the study of Spektra it was observed that the traditional concepts of marketing planning are relevant to a small to medium sized software company operating in a global market. Evidence of this can be seen in the recent re-assessment of customer needs and the realisation that the two separate technology divisions offered intrinsically the same value to the customer. Since the paper was drafted these divisions have merged back into one, and already the company is enjoying benefits of a more defined strategy and of scale and cross fertilisation in marketing and sales.
Having said this, the relative size of the company and the nature of the market necessitate a more innovative and flexible approach, both to maintain close proximity to customers and to produce new products which fulfil customer needs at a cost which ensures the requisite return on investment. Marketing orientation for a small company in a fast moving industry necessitates close and continuous contact with customers, and the key to success for small high-tech companies appears to be to take an eclectic approach, integrating a creative and flexible approach to marketing with proven formal processes, such as the NPD process.

The authors have outlined one such creative approach - the strategic platform on which the company's future direction is founded. Success is based on the combined power of all company personnel and activities working together to achieve the company's future goals and objectives. This and the customer acquisition model demonstrate both a long term strategic view in terms of developing and sustaining relationships with customers, suppliers and other providers, but also incorporate a level of flexibility that is essential for companies of this size operating in a fast changing market.

Implications for Future Research

This paper has attempted to provide a structure and framework for achieving better marketing orientation for small companies within the high-technology industry in Scotland. Previous research in this area was inconclusive and therefore it was a golden opportunity to work with Spektra to analyse, evaluate and determine the possible strategic marketing options for a small to medium size high-technology firm operating in such a volatile industry in Scotland.

Future areas of research will provide a better insight into profiling, segmentation and the value of retention and lifetime value based on the recognition of limited resources and the company operating in a fast moving environment..

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Page 22 of 25


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