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Analyzing eGovernment Research: *Perspectives, Philosophies, Theories, Methods and Practice*

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Abstract

In recent years, there has been rapid growth in the volume of research output on the topic of e-government. To understand this research better, we used content analysis of 84 papers in e-government-specific research outlets (two journals and one conference series). Our analytical focus took in five main aspects: perspectives on the impacts of e-government, research philosophy, use of theory, methodology and method, and practical recommendations. Normative evaluation identified some positive features, such as

recognition of contextual factors beyond technology, and a diversity of referent domains and ideas. Alongside this, though, research draws mainly from a weak or confused positivism and is dominated by over-optimistic, a-theoretical work that has done little to accumulate either knowledge or practical guidance for e-government. Worse, there is a lack of clarity and lack of rigor about research methods alongside poor treatment of generalization. We suggest ways of strengthening e-government research but also draw out some deeper issues, such as the role of research philosophy and theory, and the institutional factors – particularly pressures of competition and time – that may constrain development of e-government as a research field.

1. Introduction

Virtually unknown a decade ago, e-government as a term, as an identified activity, and as a topic for research has grown dramatically[1]. There are now MSc programs on e-government; several annual conferences devoted to e-government; journals devoted solely to e-government; and books on e-government (not to mention more than twenty million Web pages referring to e-government).

Because of this dramatic growth we wish, in this paper, to pause and reflect on the viewpoints, philosophies, theories, methods and links to practice underpinning e-government research to date; and to draw conclusions from that reflection about current status and possible future directions for e-government research.

One may argue about the justification of investigating e-government as an entity; particularly given its practical and academic heritage in public sector information systems: an area of activity and research for at least five decades. However, the topic has arguably attained sufficient quasi-autonomy to justify an investigation – through its conferences, journals and books; and through the new research entrants it has attracted. In addition, both intellectually and practically, e-government raises issues of information, technology and politics that neither of its main referent fields – information systems and public administration – are individually well-equipped to deal with.

As e-government researchers, we were interested in the field *per se*. However, we were also interested to look at a research field that was relatively young, experiencing high growth, and was an outgrowth of more established research fields.

Research Method

To conduct this research into e-government research, we decided to focus on e-government research *au naturel*, looking at the watering holes around which the 'intellectual convocation'[2] of e-government meet, not the far-off lakes of reference domains from which those watering holes are fed. Thus, only sources associated specifically with e-government were selected, excluding those associated with existing research domains such as leading information systems (IS) or leading public administration journals and conferences.

The three selected sources were those identified as the leading e-government-specific research outlets during the initial years of the 21st century: the refereed journal *Information Polity* (2002-2004, volumes 7-9) which almost exclusively publishes Europe-based researchers; the refereed journal *Government Information Quarterly* (2001-2005, volumes 18-22) which mainly publishes US-based researchers; and conference proceedings for the *European Conference on e-Government* (2001-2005), which are refereed at the abstract stage (plus the informal pressures of being subject to peer presentation) and which are mainly the work of Europe-based authors. Twenty-eight papers were chosen from each source, making 84 papers in all that were subjected to analysis.[34]

The authors brought no *a priori* theory or hypothesis to this research but focused on the method of content analysis of the 84 research papers as the best way of understanding the current status of e-government research. Content analysis has been presented as both a positivist[5] and constructionist[6] technique. In practice, it can be approached from either position. Our approach to content analysis – drawing particularly on the notion of 'template analysis'[7] – occupies a somewhat uneasy middle ground between positivism and interpretivism; a middle ground that we believe our own research philosophies to also occupy. On the one hand, many of the continua or categories of viewpoints, philosophies, methods, etc. have been treated as if they had some real, independent and quasi-objective existence. Rating scales have been used for the analysis of some of these. On the other hand, one can recognize the innate subjectivity of content analysis: for

example, what looks like technologically-determinist research to one person, might look like socially-determinist research to another.

Given their own resource limits, the authors attempted to give more reliability to the content analysis by first analyzing half of the papers solely for the purposes of developing the codes/categories that would be used for content analysis. In some instances (perspective and philosophies), we began with a framework for analysis; in others (theory and recommendations), we did not. In all cases there was significant iteration as issues arose in reading papers that provided clarification of earlier analysis and enabled a revision to our content codes/categories. In the end 25 analytical scales of codes or categories were used.

Having done this, an initial sample of eight papers was selected and independently coded by each author Of the 200 points of comparison (eight papers x 25 analytical scales) within the content analysis, there was exact agreement on more than 75%. The following actions were then taken:

- For nine of the 25 analytical scales both authors coded all eight sample publications exactly the same; and for two of the scales there was exact agreement for seven publications. In both situations – i.e. for eleven scales in all – the scales were not revised in any way as no clear point of clarification or revision emerged.
- For six of the analytical scales there was coding agreement for six of the eight sample publications; and for two scales there was coding agreement for five publications. All of these scales were clarified; either requiring the clarification of an individual rating

(e.g. that to count as a "project" the writer would have to have worked in some implementation capacity on a project), or of the scale (e.g. that a statement on research methods would not require explicit use of the term "method" or "methodology" but merely explicit identification of data sources for the article).

- For four of the analytical scales, the authors coded four of the publications identically but differed on coding of the other four publications. In this case more significant changes were undertaken such as recalibration of the scale, or removal of some coding items.
- For the remaining two analytical scales, the authors differed on the coding of six of the eight sample publications, only coinciding on two publications. In the case of contextual recognition, this was revised through use of a diagrammatic guide to levels of context. In the case of recommendation type, this scale was removed from the coding schedule.

Within the coding differences, there were four cases found of missing or miscoded items. This led us to undertake a double-check of all coded items before they were passed forward for analysis.

Having undertaken the development and validation of our analytical scales, we then proceeded to analyze and code/categorize all 84 papers. The findings from this analysis are laid out below but one must note that these are our interpretations of content. In some cases, this is relatively uncontentious – for example, detailing the author's home department. In many cases, though, there has been interpretation of statements, for example, discussing whether the impact of IT in government is positive or negative.

Even though coding focused on explicit value statements, interpretations can be open to argument. In some cases, we had to infer underlying ideas that are nowhere stated explicitly – for example, the underlying research philosophy of a paper – though these cases are clearly identified.

This should be borne in mind in considering the analysis which, for each paper, covered five main items, whose selection was influenced but not determined by earlier research analyses in information systems and in public administration[8]:

- Statements about impacts associated with e-government, their content and their causes.
- Statements – implicit or explicit – about underlying research philosophy.
- Evidence of research methodology and methods.
- Use of particular theories or models.
- Recommendations.

Each of these analyses will now be discussed in greater detail to fulfill the purpose of understanding the current standing, strengths and weaknesses of e-government research.

2. Perspectives on Impacts and Impact Causes in eGovernment Research

We begin by presenting an overall framework for understanding perspectives on both the impacts associated with IT introduction, and the causes of those impacts. This framework can be applied in several ways; for example, to understand change in public agencies or – as here – to analyze the work of commentators who write about e-government. It is taken from Heeks[9] as a development of work by Rowe[10].

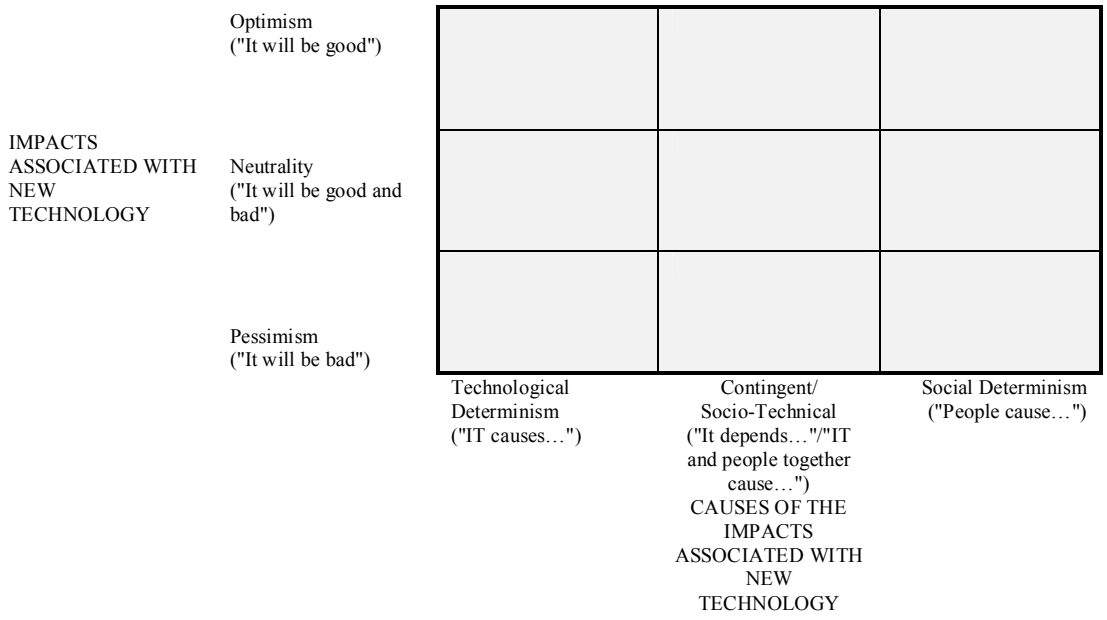
The framework is constructed from two continua (see Figure 1). First, a continuum of perspectives on *technology impacts*, from optimism to pessimism. Some commentators – optimists – associate IT with largely positive impacts, and will use value statements about cost-saving and improvements in public service quality. Others – pessimists – associate IT with largely negative impacts, and will use value statements about high costs or loss of public accountability.

Second, a continuum of perspectives on *impact causes*, from technological determinism to social determinism. Some commentators – technological determinists – believe that it is mainly inherent features of the technology which determine impacts of introducing IT. They will use value statements that directly associate the technology with its impacts, e.g. that computers in the public sector cause job losses. Others – social determinists – believe that it is mainly human choices within social structures which determine impacts of introducing IT. They will use value statements that associate human agency with

impacts; e.g. that any job losses linked to computerization arise when public managers decide to exploit employees.

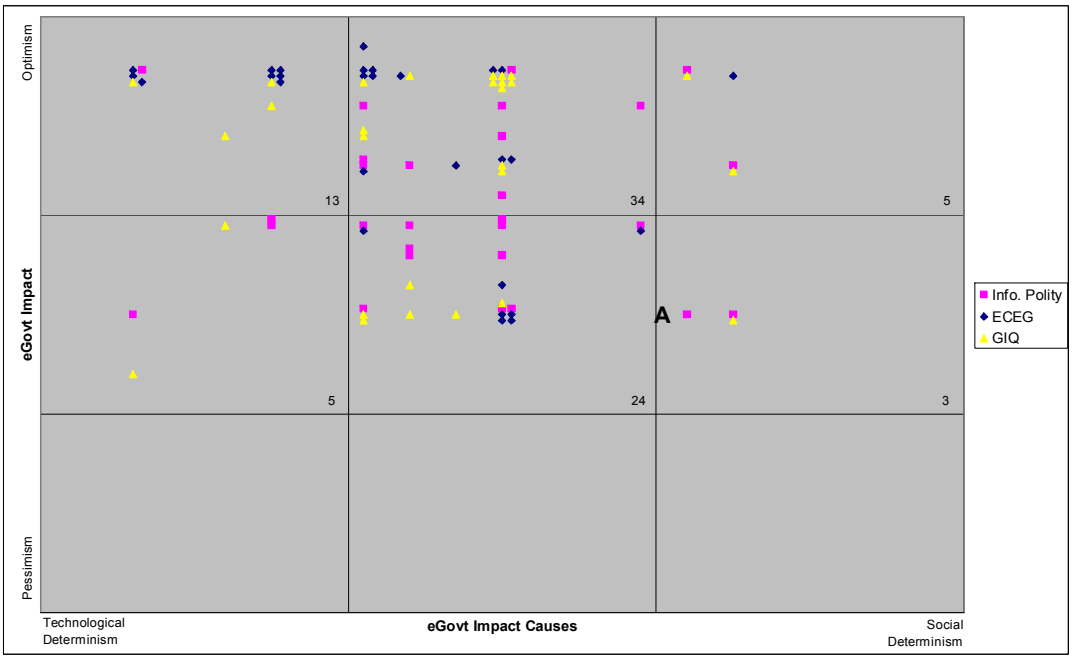
Each continuum has a midpoint of, respectively, neutrality about impacts (e.g. value statements about both good and bad impacts) and either contingent or socio-technical underpinning to the causes of those impacts (e.g. value statements about IT enabling or supporting outcomes that are also guided by human agency).

Figure 1: Framework for Analyzing Different Views About eGovernment



Such a framework necessarily simplifies a complex reality but it can be used to understand differing positions on information technology and government. Our interpretation of the viewpoints found in the studied e-government literature is shown in Figure 2.[11]

Figure 2: eGovernment Research Viewpoints on Impacts and Causes



Our own work and analysis on e-government suggests a position around point A in the diagram[12]. In terms of impacts, it indicates that introduction of IT into the public sector can be associated with impacts perceived to be both positive and negative; and that the same particular impact can be perceived by one stakeholder as positive while perceived by another stakeholder as negative. In terms of causes, it suggests that the impacts associated with e-government are largely the result of human agency shaped by social context. Technology plays a – lesser – role of shaping human intentions and choices and is, itself, shaped by human intentions and choices.

For us, the 'glass half-empty' perspective on the findings is to see that almost all of the analyzed papers take a position that is more positive and more technologically-

determinist than position A. In particular, there is what one could characterize as a naïve optimism and lack of balance in well over half the papers, which simply seem to regard IT as a 'good thing' for government, ignoring the evidence about downsides to technology and ignoring the evidence of the widespread costs of failure of e-government[13].

This may arise because of the general hype around e-government. Certainly within the magazine literature on e-government (some of which is written by IT vendors), the vast majority of material lies firmly in the optimistic camp. Most researchers appear relatively new to work on e-government (as one indicator, only about one-third of authors self-cited their own earlier work on e-government or public sector information systems)[14]. Of the new authors (no self-cites), half were wholly positive about e-government; of more established researchers, less than one-quarter expressed a wholly positive view. Being new to a field may make researchers less confident about challenging particular dominant discourses; such as hype about the positive impact of e-government.

We can also suggest one other partial explanation for the strong seam of optimism within these e-government papers: self-interest. Fifteen of the authors had direct roles in the projects, products or services their papers described. Of these, only five gave a mixed or mixed-to-positive view on e-government; all the rest were entirely positive. Put another way, two-thirds of those with a direct self-interest in e-government rated it wholly positive; less than one-third of those without a direct interest did the same.

However, there is also a 'glass half-full' perspective. Just over one-half of authors add at least some question marks to the hype about e-government's benefits. The majority of e-government researchers reject crude technological determinism in favor of a recognition that human or social factors have at least some role to play. From our viewpoint, then, there are grounds for hope in the apparent perspective of many e-government researchers.

3. Philosophies in eGovernment Research

One can start with a simple model of research philosophies; with the implicit notion of a continuum of philosophies bounded at its extremes by positivism and social constructionism. Although there are criticisms of this, and other schema of philosophies have used bi- or multi-dimensional frameworks[15], this type of continuum from the objective to the subjective is quite frequently used as a core concept for research categorization[16].

To flesh out the continuum, one may look first at positivism and e-government. Positivist e-government studies would hold a realist, objective ontology (set of assumptions about the nature of reality). They would assume that key variables in e-government (for example, technology, skills, work processes, work culture) actually exist; and that they are related by a set of causal relations explicable by underlying and generalizable 'laws'.

Positivist e-government studies would hold an empiricist epistemology (set of assumptions about how one should gather data about the world) that would seek to observe key e-government variables and to experiment in order to build knowledge about underlying relations and laws. They would assume that data and data-gathering are independent of the observer and of his/her interests and qualities.

By contrast, social constructionist e-government studies would hold a subjective ontology. Whilst accepting the material existence of physical objects, such as computer hardware, they would assume that what matters about any variable – material or immaterial – is the particular meaning given to that variable by each individual. Those meanings are subjective creations constructed through interactions with others.

Social constructionist e-government studies would thus hold an epistemology that assumes the focus of finding out is the particular constructions and meanings that individuals hold about facets of e-government. They would assume that the researcher's own constructions and interests cannot be detached from the research study.

One can illustrate the difference by taking an attempt to study e-government and organizational culture. A positivist study would assume that culture has some objective existence independent of any particular individual, that it can be observed, and that its existence and relations to other variables can be measured in some way. For example, this study might seek to measure the strength or type of culture and its impact on certain measurable outcomes, such as progress along some e-government scale. It might

typically do this using a questionnaire sent to a large and representative sample of respondents.

A social constructionist study would assume that culture has no objective existence. The meaning – hence the influence – of culture is created through social interaction but the meaning is ultimately the subjective and different construction of each individual involved. For example, this study might seek to investigate what culture means to public servants, how the meaning of culture is created, and what relationship is perceived by each individual between culture and e-government. It might typically do this using in-depth unstructured interviews with a few respondents.

While characterization of continuum extremes is relatively easy, characterization of any intermediate position is less so because some see the underlying assumptions of the extreme positions as incommensurable, thus hampering any mid-point compromise; and because other research philosophies introduce new dimensions that need to be taken into account. Nonetheless, one could hold in mind approaches such as critical realism and relativism as candidates for the 'murky middle'.

On analyzing the papers, the authors found no reference – not even a passing one – to concepts of research philosophy such as ontology, positivism, epistemology, paradigms, etc. in any of the 84 publications. We were therefore left with having to infer the underlying philosophy, principally from the way in which key phenomena were treated

by the researchers. Were these phenomena treated as real and objective, were they treated as social constructions, or were they treated in some other way?

Alongside these ontological inferences, the authors hoped to draw out some epistemological inferences but these proved impossible for many papers. As discussed further below, only five studies made use of the kind of statistically-valid large-scale survey with which positivism is clearly associated and less than a quarter had any real sense of methodology (drawing validity from statistical scale or from triangulated methods). Most gathered their data through a rather unsystematic review of some items of literature, or some government documents. We felt unable to draw epistemological inferences from such work since the reasons for selection of most methods were unclear, and quite possibly reflected low effort requirement rather than well-thought-out epistemology. Similar problems were faced in the poor treatment of generalization (see below) and of hypothetic-deductive vs. inductive approaches, with only four papers adhering clearly to such approaches[17].

From this, admittedly rather limited, base we identified just under one-quarter of the papers as positivist: treating key factors as real and objective and measurable and involved in cause-effect relations. Even this required a rather loose view of positivism. Had Orlikowski & Baroudi's identifying features been applied[18] – "evidence of formal propositions, quantifiable measures of variables, hypotheses tested, and the drawing of inferences about a phenomenon from the sample to a stated population" – only one paper would have been classed as truly positivist.

Of the remainder, almost all were some kind of even weaker or more confused positivism. By this we mean that they treated factors as if they were real and objective yet failed to treat them as if they were measurable or involved in cause-effect relations; or that they treated some factors in a clearly positivist manner but at other points in the paper introduced notions of inter-subjectivity or even subjective construction.

No papers could be described as adhering to a social constructionist perspective. Nor were there any that drew from the critical tradition (critical in the sense of looking at the systemic and contradictory social structures that impinge on individual actors). Just six were allocated to some kind of 'center' position. Typically, this was some variation of critical realism; treating key factors as if they were real but accepting elements of subjectivity or inter-subjectivity in the way those factors are perceived.

This throws up the dangers of an arid monoculturalism in e-government research. Adopting a relativist position, one may see a whole range of evidence and insights on e-government as yet undiscovered – issues about why e-government is being pursued or about the true value and impact of its claimed benefits – because of the absence of interpretivist or critical work, and because of the dominance of a feeble positivism.

It also throws up the issue of the absence of any overt role for research philosophy in e-government research. The research work analyzed here contained no clear statement of research philosophy. Put bluntly, if this means research philosophies are not being

thought about and used, then where is the fault – with the researchers, or with the notion of research philosophy? At least some of the work is producing practical recommendations and/or is being cited by other e-government researchers, and can therefore be construed as useful in some academic or practical sense[19]. One is left, then, with an open question about the importance and role of research philosophy in e-government research.

Just two thoughts will be offered here. On the one hand, explicit recognition of research philosophies can help researchers' self-development, their capacity to analyze the work of themselves and others, and the academic credibility of a research field. On the other hand, as Easterby-Smith et al[20] note, even those writing on research traditions admit that the kind of extreme positions outlined here are theoretical stereotypes that may bear little relation to either the espoused positions of actual philosophers, or to the actions of actual researchers.

Certainly, there seems limited value in trying to go much beyond an 'off-the-shelf' attitude to philosophy; for example, in spending time debating the merits and demerits of different research philosophies for e-government research. Uncertainty over the validity and consistency of philosophical positions undermines such debate and, in related fields, such debates have been characterized merely as means to "entertain and distract a discipline when it lacks substantive theory to debate."[21]. To avoid being distracted further, it is to theory that this paper now proceeds.

4. Theory in eGovernment Research

eGovernment can be seen as sitting at the cross-roads between a number of other research domains, particularly computer science, information systems, public administration, and political science. Not surprisingly, these were reflected when one came to analyze researchers' departments (see Table 1) but so were a variety of other backgrounds, including linguistics, development studies, and statistics.[22]

Table 1: eGovernment Researcher Home Departments

Academic Department	Frequency
Business/Management	11
Public administration	10
Political science	8
Computer science	8
Library and information studies	6
eGovernment	6
Information systems	5
Government/Governance	4
Non-academic research institution	3
Other	14

Source of the main literature used in the papers (perhaps a better guide to a researcher's domain than the name of their department) was also analyzed (see Table 2).[23]

Table 2: Main Literature Used by eGovernment Researchers

Literature Used	Frequency
eGovernment	33
Information systems (inc. e-business)	19
Public administration	9
Management	8
Political science	5
Computer science	5
Other	2
Just one/two items used	13
No literature used	8

The number of papers (one quarter) that had little or no literature is surprising (particularly since fourteen of these appeared in the refereed journals). In other ways, though, the two tables above confirm the expectation that research in e-government represents quite well its various component roots. Writers are drawn fairly evenly from the broad fields of "governance" (public administration, political science, and government) and "informatics" (IS, library and information studies, and computer science), and they draw from literature in both fields as well as drawing from e-government itself: a partial sign that e-government is becoming a domain in its own right. Overall, then, a diversity of different disciplinary perspectives is being brought to bear on e-government; something that in 'research ecology' terms can only be good.

Having said this, there is a predominance of literature coming from information systems; particularly given that at least some of the e-government literature cited is essentially an IS or e-business idea modified in some small way to fit the public sector context. Put

another way, literature on governance remains relatively underused by e-government researchers[24]. One should also be aware of the dogs that did not bark – literature and ideas from economics and from sociology were not represented, even though both disciplines have made significant contributions to both informatics and governance research.

Despite this absence, it had been our assumption that a variety of different theories would be utilized in work on e-government, and a key aspiration of our analysis was to highlight the different theories that can be used in researching e-government. Beyond this, we began our analysis of theory with no preconceived framework. However, one did emerge from content analysis – a fairly rough-and-ready continuum of the frameworks of knowledge used or produced within e-government research:

- *Theory-based work*: this makes clear use of an identified theory, either applying or testing that theory, and referring to 'theory'.
- *Framework-based work*: this makes use of a framework that explicitly derives itself from a body of theoretical work. For example, a framework of different perspectives on regulation, based on ideas from theories in political science.
- *Model-based work*: this makes use of a model that is presented without reference to any deeper framework of knowledge. The most common example, mentioned in eleven of the papers, was some variant on the four-part 'Web stage' model (e.g. information – interaction – transaction – transformation).
- *Schema-based work*: this uses a schema of techniques or a technical architecture for e-government, such as a data architecture.

- *Concept-based work*: this uses a particular concept, such as 'stovepipe government'.
- *Category-based work*: this presents a set of categories, or a list of factors, such as features to be found on e-government Web sites.
- *Non-framework-based work*: this makes no use of any discernible framework of knowledge; it merely provides a set of data and ideas.

Table 3 shows the frequency with which the different types of e-government research work appeared.[25]

Table 3: Frameworks of Knowledge Used in eGovernment Research

Knowledge Framework	Frequency
Theory-based work	1
Framework-based work	10
Model-based work	29
Schema-based work	8
Concept-based work	4
Category-based work	22
Non-framework-based work	10

Our initial aspiration, then, was not realizable. Only one paper used theory – new institutionalism – and even then it was not the main focus for the paper. There were just one or two examples of frameworks drawn from public administration, political science, and information systems theories but in a number of cases these were presented in the paper but never used. Otherwise, though, theory in an academic sense made no appearance in this e-government research, and these rich bases of knowledge from e-government's component disciplines were not tapped.

It is the governance literature that seems to be make the weightier contribution to e-government: most frameworks and theories come from this root, with information systems literature used more for models and schema. This may relate to the writers' academic base: those in informatics departments made no use of frameworks and only limited use of even models; by contrast one-third of those from governance departments used a framework and most of the rest used a model of some sort. The e-government literature has not yet been a generator or source of frameworks, let alone theories: it currently provides other researchers with just models or lists, particularly with the four-stage Web model of e-government.

A key, but difficult, question to answer is: is the absence of theory a problem? For example, can e-government research not focus on building knowledge through creation and refinement of models? It could, but in support of theory-usage one can note four arguments for the value of theory[26]:

- a means for researchers to communicate with practitioners;
- a means for researchers to communicate with each other;
- a means for accumulation of knowledge;
- a means for legitimacy and recognition of the field as an academic discipline.

The relative absence in e-government research of practical recommendations offering clear guidance is discussed below. Here, one can note that the models being presented might give some insights into *what* is happening in e-government but few are offering any understanding of *why* things are happening. Theoretical perspectives may do the

latter, and so may help e-government practitioners understand why, for example, models that work well in one place do not work well in another.

Looking at the other 'values of theory', there is a danger with models of reinventing the wheel, or of e-government research being characterized by megaphone discourse, with each researcher loudly plugging his/her own model, and ignoring all others. There are definitely signs of a lack of communication, and a lack of legitimacy and recognition for e-government research as a field. The plethora of different models is one indicator, with the stage model (albeit different variants) being the only model found in more than one of the papers. There is thus a lack of coherence, and a lack of common bases for communication and accumulation of knowledge within the field[27].

One can also see evidence of a perceived lack of legitimacy from the way in which e-government researchers themselves treat the e-government literature. At first sight, engagement with e-government literature by e-government researchers seems good. Around two-thirds of all papers cite five or more items of e-government literature.[28] Only eight cite no e-government literature. However, the picture was less positive when one came to look at the origins of the main models, schema, concepts, lists, etc. that were used in research papers. In sixteen cases these came from the e-government literature but nine of those were the Web stage model that is essentially a creation of the e-business literature.[29] In other words, e-government researchers are rarely using other e-government research in any fundamental capacity in their own work.

In some ways, this is both expected and welcome. eGovernment is a new and growing area that is being rapidly colonized by researchers from nearby disciplines, who bring with them their various accumulations of knowledge. Being new, it has had limited time to develop its own conceptual foundations. What it does mean, though, is that, in general, the e-government researchers studied here are either applying models and concepts from outside the e-government arena; or they are building their own models and concepts.

In the context of a different IS-related research domain, the authors have been disparaging about the fact that researchers were 'theory-applying' rather than 'theory-building'[30]. But e-government research is far from even this – not only is it neither theory-building nor theory-applying, it has not even reached the level of accumulating knowledge about its own models. The image is of random rocks being thrown into a pool, rather than building cairns of knowledge.

This domain is also a one-way recipient of knowledge transfers from outside e-government to inside; and it appears a very long way from being a knowledge-exporting domain. If e-government's own researchers seem loath to use the field's own models and ideas, how much less likely are researchers outside this field to do so.

5. Method and Methodology in eGovernment Research

Of classifiable papers, just under two-thirds used primary data (though this included papers where practitioners reflected on their own experiences), and just over one-third used only secondary data. Roughly three-quarters of papers used solely qualitative methods while just seven (less than 10%) used a solely quantitative approach, and ten (12%) used a combination of quantitative and qualitative methods.

A broad spread of methods was found amongst the papers, including a Delphi study and scenario planning alongside interviews and questionnaires. However, all these were in a minority (see Table 4). Of those papers that did have a method, the most widely-used was what we called 'hunt and peck': a review of some relevant sources but without the rigor that might allow the approach to be called a proper literature review[31].

Table 4: Research Methods in Use by eGovernment Researchers

Research Method	Frequency
No discernible method	20
Hunt and peck	19
Questionnaire	15
Document analysis	14
Interview	14
Web content evaluation	7
Literature review	6
Reflection on project experience	6
Observation	3
Other	7

Alongside this weakness, some others were noted:

- Less than a quarter of papers (twenty) used a combination of methods, such as interview plus document analysis. There was thus limited evidence of triangulation of

method, which – for some qualitative methodologies at least – forms a basis for rigor and validity in research findings. One cause reported from both information systems and public administration is a dominance of training related to rigor and validity in quantitative methods; a virtual mirror-image of actual research, which is dominated by qualitative methods[32].

- Another 'ecological weakness' – i.e. reflecting a limited diversity in e-government research – was the predominance of cross-sectional research, representing more than four-fifths of all papers studied. Some others provided some type of historical perspective as an important theme, but only a single paper could legitimately be called longitudinal in its approach.
- Despite the implied positivism underlying most of the e-government research, only six papers undertook work that was amenable to statistical analysis.
- In only one in seven papers was it clear that the researchers had left their own offices and ventured out to do their research. The great majority of e-government researchers appeared to do little more than sit at their PCs. Per se, this does not invalidate research but large tranches of data, events, opinions, etc. are inaccessible to such researchers. This might, for example, explain the absence from some research of the human, social, political elements that more easily become apparent during direct contact with data subjects and settings: on average those who had clearly left their office took a balanced socio-technical perspective on e-government; those who had not generally saw technology as the main change driver.

Worse still was the treatment of research methodology and method within papers. Only nineteen (almost all journal articles) had a section heading on research method or study; and three-fifths made no statement at all explaining how data had been gathered for the reported research (for several which did, their statement amounted to just a single sentence). In some cases, research method could be implied but in twenty papers it was impossible to understand how data had been produced.

Such weakness in conference papers is disappointing and represents poor practice. But the fact that over half the refereed journal articles provided no statement on data-gathering method more seriously undermines the credibility of e-government as a research domain. There are honorable exceptions but the modal image of e-government 'research' is of academics sitting in their offices producing "I think it, therefore it is true"-type work.

This notion extended to the use of generalization, where the norms of rigor were frequently violated. Just twenty papers appeared to stick to these norms as justified by their data: either drawing conclusions only about the one case that had been studied; or – in five of the cases – allowing some generalization if a valid population sample had been surveyed.[33] Only two papers discussed the legitimacy of generalization. The majority of papers played fast and loose with their findings, typically generalizing their findings to all e-government projects or to all instances of a particular phenomenon on the basis of just a handful of data points, be they cases, items of literature, or reflections on personal experience.

Poor choice of language may have played a role in a few papers but the overall impression given was of a set of researchers who lacked a proper sense that their data had limits. The dominant image can be modified to "I think it, therefore it is true everywhere": full marks for self-confidence but *nul points* for rigor.

6. Recommendations in eGovernment Research

Above, was noted the weakness of analyzed e-government research in terms of not just its contribution to, but even its use of theory. What, then, of its practical side? Perhaps the lack of engagement with theory can be explained by a focus on practice, and practical recommendations. For those who feel the job of researchers is not merely to interpret the world but to change it, such a focus might be a positive feature of this field, which has significant potential to produce results of practical value[34].

Unfortunately, the current batch of e-government research once again disappoints. The papers were analyzed for practical recommendations: specific action points that someone involved with e-government could use. Of the 84 papers, only 40 (less than 50%) had any specific practical recommendations.[35] Even these were of limited value: three-quarters gave a few single sentence or, at best, single paragraph recommendations. Only four gave any specific guidance on *how* practitioners should take action; the rest just explained *what* practitioners should do (as an example one paper specified a

recommendation of "internationalization of the constitutional state"). Given data limitations, e-government "research is badly tied to practice … it neither learns much from practitioners' experiences nor inspires changes in practice."[36].

So, overall, most of the research on e-government falls between the stools of theory and of practice. It does not add to the body of theory. Nor does it significantly help to improve practice. For most work, then, there was no link between theory and practice because there was neither theory nor any particular practical value.

Beyond this was another finding: that there was no relationship between "theory-ness" and "practicality" in the research analyzed. As one moved up the "frameworks of knowledge" continuum outlined above, overall, the research became no more likely to offer practical recommendations. So there was no support for the idea that, the less researchers have to do with theories or models, the more likely they are to produce practical action points. Nor, however, was there support for Lewin's adage that there is nothing so practical as a good theory.

Finally, the authors were struck by the recommendations in a number of papers – not just in the conferences but also two journal articles – that read like 'advertorial': adverts masquerading as 'research'. At first, this looked like a black-and-white issue. Such papers were written by designers or implementers of particular information systems, and they sought to promote the purchase or use of those systems.

On further analysis, though, distinctions began to fade. In roughly half of the papers analyzed, there was presentation and either explicit or implicit promotion of some artifact of which the author was creator: an e-government-related product, or services, or architecture, or model. And all papers present a set of ideas that, by dint of their being published, the author is seeking to promote; to sell in some sense. So perhaps it is unfair to single out those with tangible artifacts or from profit-making organizations. Perhaps research – in e-government as elsewhere – has always been about self-promotion as much as promotion of knowledge. Perhaps all researchers should be honest about the fact that everyone has something to sell, and that sales and marketing are inherent to the research process.

7. Conclusions

There has been a rapid – explosive even – growth in e-government research over the past few years. Some review papers are starting to emerge[37] but these have focused on synthesizing models or factor lists or definitions. The work reported here has a deeper mission – to looking at underlying perspectives and approaches to e-government research.[38]

Taking a normative perspective, one can see positive features – 'good practice' even – within current e-government research:

- Significant recognition of human and other contextual factors that influence or mediate the impacts of e-government.
- Use of a diverse range of ideas from other research domains, including information systems, public administration and political science.
- Reference to other e-government literature in almost all research work.
- Presence of a range of different research methods, and broad use of primary data.

On the other hand, there is what one might characterize as 'narrow practice':

- A strong theme of over-optimism, even hype, and a consequent lack of balance in considering the impact of e-government.
- Dominance of positivist research approaches, alongside absence of statements on research philosophy.
- Dominance of a-theoretical approaches that, simultaneously, often fail to provide any significant practical recommendations.
- Little use of frameworks of knowledge from governance, and little use from within e-government in order to encourage an accumulation of knowledge.
- Dominance of research methods that require no face-to-face engagement with the realities of e-government, no statistical analysis, and no longitudinal engagement with e-government projects.

Further, there are too many instances of what one might characterize as 'poor practice':

- Little recognition of underlying perspectives, with weak, confused or even contradictory positions about e-government or about the underlying philosophy being espoused.
- Lack of clarity about underlying assumptions, about methodologies, and about how data was gathered for the reported research.
- Lack of rigor in the collection and analysis of data, and in generalization from that data.
- Unsubtle promotion of a writer's own products or services.

Change over time seems limited. There has been no change in average views on impacts and causes. Use of higher-level frameworks and use of e-government literature has increased somewhat if one compares 2005 papers with those published in 2001, but confidence in any trend is undermined by much larger year-to-year variations.

eGovernment research thus deserves the 'fragmented adhocracy' label given to information systems research up to the 1980s[39]: with limited functional dependence of using the findings of earlier work; limited strategic dependence of researchers needing to convince peers of the importance of their work; and high strategic task uncertainty in terms of prioritized problems to research.[40]

In this and other ways (such as the dominance of descriptive and subjective/argumentative work), one sees strong resonances between the status of e-government research today, and the findings of analyses of information systems and

public administration research in the 1970s and 1980s. However, in some ways, e-government has not even got that far. The notion of adhocracy, for instance, extends much further: to the cavalier way in which philosophies, research methods, and recommendations are treated. Benbasat & Zmud and Gill & Meier contrast the tension between rigor and relevance in IS and public administration research[41]. For much e-government research, this tension does not exist: it is neither academically-rigorous nor practically-relevant.

eGovernment research is therefore in a poor state: viewed as the offspring of information systems and public administration, it is the child of two parents that are themselves perceived as intellectual weaklings – accused at times of philosophical, theoretical, methodological and practical shortcomings[42] – and shows all signs of having inherited the expected "genetic" profile. It could be left in this state but there are arguments for strengthening because e-government does encompass some core issues at the intersection of informatics and governance that its referent fields appear ill-equipped to deal with[43]. There is even the potential, in the study of information/technology combined with politics/the specifics of the public sector, that e-government research may offer new conceptual, even theoretical, insights.

In seeking to move on from this point, one can pick up on a set of prescriptions that address some of the practices noted above. The type of changes suggested by these prescriptions have been taken as signs of greater maturity of a research domain[44].

It is easy to be prescriptive and tell those working in the e-government research domain what they should be doing:

- Provide clear statements on research methodology and method, and on personal interests in any research artifacts.
- Use research methods in a manner that strengthens the qualities (such as validity, reliability and generalizability) of the research.
- Avoid inconsistent or weak use of perspectives and approaches, and invalid generalization of findings.

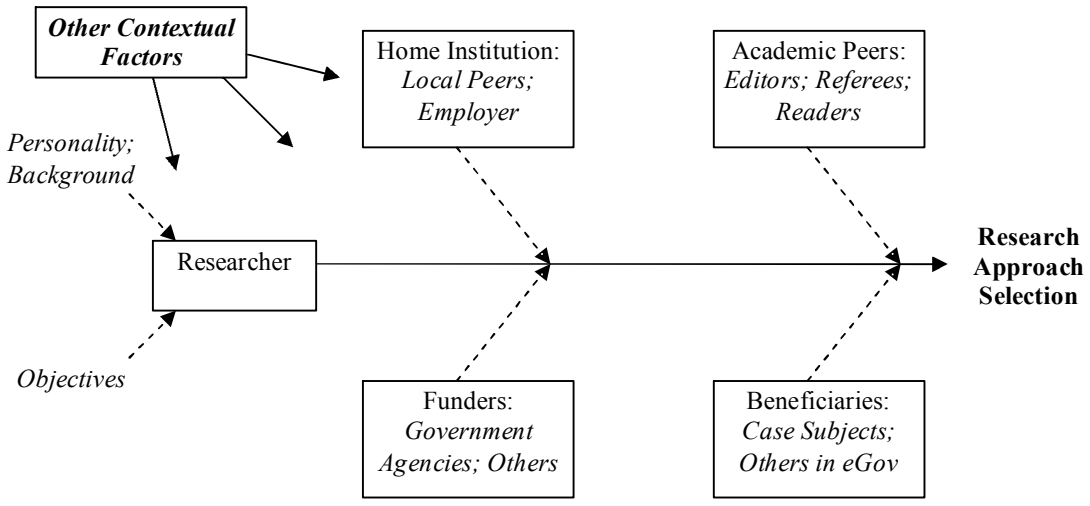
These actions are surely the prime focus for e-government as a research domain if it is to mature beyond its current infantile status; and should be seen as a central responsibility not just for researchers but also for research funders, journal editors and conference chairs. For the longer-term, though, one may also be quasi-prescriptive and encourage better or broader practice among e-government researchers:

- Greater self-awareness from e-government researchers about the perspectives and approaches they adopt in their research, greater awareness about the implications and limitations of those perspectives and approaches, and greater awareness about the existence of alternative perspectives and approaches.
- Use of a broader range of research traditions, with incorporation of more critical realist, social constructionist, critical, and other types of research into the e-government arena. This pluralism can help illuminate current blind spots in e-government research and may (following Galliers[45]) be more relevant to the current issues facing e-government practitioners.

- Explicit engagement with information systems, political science and other social science theories in order to improve the communication and accumulation of knowledge. Some have discouraged over-diversity of theoretical bases, seeing this as stifling knowledge-building; and also seeing use of 'external' theory as reducing the legitimacy of a research domain[46]. But e-government is still far from this problem – use of any theory will boost rather than harm its knowledge-building and academic legitimacy. Fairly obvious candidates for theory use include new institutionalism, policy networks and actor-network theory[47].
- Greater engagement with frameworks and models that emerge within the e-government literature. This is commensurable with the previous recommendation by working to create an ancestry for existing e-government models in appropriate referent theories.
- Use of a broader range of research methods in order to develop a richer range of data on e-government. This means moving away from the dominance of 'hunt and peck' and personal reflections to greater use of both 'traditional' methods such as interviews, surveys and observation; plus others such as participant observation, content analysis, and critical incident technique. As part of this, it would be good to see greater use of out-of-office data-gathering.
- Demonstrating the contribution that research can make to the practical application of information systems in government. For this, one can see a value in greater use of framework models, that help span the gap between theory and practice.

However, we would not only like to talk about *what* is happening in e-government research but also to understand *why* it is happening. Here, one can draw on the ideas of those who have analyzed research domains[48] to help understand the factors that influence researchers in their selection of philosophies, theories, etc. These are synthesized into Figure 3, with each stakeholder imposing certain institutional constraints that may be either formal (e.g. funding or editorial guidelines) or informal (identified goals of the researcher, or expressed needs of potential research beneficiaries).

Figure 3: The Research Context



At present, it would appear in e-government research – at least in the type of research outlet studied here – that a permissive attitude from academic peers and others is allowing the profile of research characterized above. This attitude likely stems partly from the rapid growth in the number of outlets for e-government research; a growth that appears faster than the supply of high-quality research to fill those outlets. Conferences and journals therefore feel a pressure to relax standards because they have to get enough

delegates, or they have to fill each issue and publish on time. The recent arrival of new e-government journals (such as *eGovernment Quarterly*, the *Journal of E-Government* and the *Electronic Journal of eGovernment*) may thus pose a serious challenge for the quality of published research on e-government.

At the same time, there are other contextual pressures that affect researchers. The first is the relative immaturity of the field, which will have affected use of theory and approaches to accumulation of knowledge. It may also play a role in some of the other narrow/poor practices identified above.

In the past few years, research has become more globally competitive. In addition, ongoing technical change impacts the e-government research agenda, and the area has been something of a research gold-rush, with new entrants flocking in as the profile of e-government as a domain has risen. All of this adds a further contextual factor: intense time pressures on researchers, with the temptation to do something quick rather than do something good. There were certainly signs of this in the analyzed work: using a quickly-grasped model rather than a complex theory; staying in the office rather than getting out; undertaking cross-sectional rather than longitudinal work; reflecting on personal experience rather than talking to others; reading a few Web-based articles rather than performing a systematic literature review.

Whichever way one analyzes this context – in institutional[49] or in actor-network[50] terms – one sees the constraints that exist to change. Looking at three key factors, then the *youth*

of the field will inevitably change with time. The *level/quality of e-government-focused research outlets* will be harder to change. Unless significant supporters emerge favoring some of the prescriptions identified above – perhaps particularly amongst editors and leading researchers – then the ability of e-government research to become a higher-quality, more pluralist field will be limited. Finally, there are few signs that *time pressures* will ease; again presenting a significant challenge to hopes that e-government research may be able to 'raise its game'.

Notes and References

[1] The term "electronic government" seems to have first come to prominence when used in the 1993 US National Performance Review, while "e-government" seems to have first come to prominence in 1997; see: Grande, J.I.C., Araujo, C.R., & Serna, M.S. (2002, September 4-7). *Research on e-Government: A Proposal of Theoretical Framework*. Paper presented at 2002 EGPA conference The European Administrative Space, Potsdam, Germany; and Relyea, H.C. (2002). E-gov: introduction and overview. *Government Information Quarterly*, *19*(1), 9-35. The growth of e-government research stands in marked contrast to an earlier decline and paucity noted by Kraemer, K.L., & Dedrick, J. (1997). Computing and public organizations. *Journal of Public Administration Research and Theory*, *7*(1), 89-112. It is rooted in the growth in practice seen following diffusion of the Internet; see: Gronlund, A., & Horan, T. (2005). Introducing e-gov: history, definitions and issues. *Communications of the Association for Information Systems*, *15*(May), Article 39.

[2] King, J.L. (1993). Editorial notes. *Information Systems Research*, *4*(4), 291-298.

[3] *Government Information Quarterly* has become a source associated with e-government but it has a background in library and information studies. Given our focus, we selected only those papers – 28 in all – with e-government (or e-governance/digital government) in the title. To give equal balance to all three sources, we thus chose 28 papers from *Information Polity* (the first ten papers from volume 7, the first nine

papers from volumes 8 and 9); and 28 papers from the *European Conference on e-Government* (the first seven papers from each of four conference proceedings (we were unable to access the 2002 proceedings)).

[4] Of the 84 first authors, 27 were US-based (mainly writing in *Government Information Quarterly*); 12 were based in the British Isles (UK and Ireland); 12 were Netherlands-based (all but one writing in *Information Polity*); 5 each were based in Denmark and Germany; 14 were based in eight other European countries such as Greece and Spain, 5 were based in other Commonwealth countries, and 4 were from other countries. Only three of the 84 were based in a developing country. The G8 nations all have significant e-government programmes yet Italy and Russia were unrepresented while Canada, France and Japan were each the base for only one author.

[5] Neuendorf, K.A. (2002). *The Content Analysis Handbook*. Thousand Oaks, CA: Sage Publications.

[6] Jankowicz, A.D. (2000). *Business Research Projects*, 3rd edn. London: Business Press.

[7] King, N. (1998). Template analysis. In G. Symon & C. Cassell (eds), *Qualitative Methods and Analysis in Organizational Research* (pp118-134). London: Sage Publications.

[8] For example: Flynn, D., & Gregory, P. (2004), The use of social theories in 20 years of WG8.2 empirical research. In B. Kaplan, D.P. Truex, D. Wastell, A.T. Wood-Harper & J.I. DeGross (eds.), *Information Systems Research: Relevant Theory and Informed Practice* (pp365-388). Norwell, MA: Kluwer Academic Publishers; Lowery, D., & Evans, K.G. (2004). The iron cage of methodology. *Administration & Society*, *36*(3), 306-327.

[9] Heeks, R.B. (forthcoming). *Application and Impact of eGovernment: An International Text*. London: Sage Publications.

[10] Rowe, C. (1990). *People and Chips*. London: Paradigm Publishing.

[11] Some of the data points have been offset slightly in order to make the distribution of papers clearer.

[12] Heeks, R.B. (2003). eGovernment in Africa: promise and practice. *Information Polity*, *7*(2-3), 97-114; Heeks, R.B. (2006). *Implementing and Managing eGovernment: An International Text*. London: Sage Publications.

[13] Korac-Boisvert, N., & Kouzmin, A. (1995). Transcending soft-core IT disasters in public sector organizations. *Information Infrastructure and Policy*, *4*(2), 131-161; Heeks, R.B. (2001a). Explaining

success and failure of e-government. In D. Remenyi & F. Bannister (eds), *European Conference on e-Government* (pp163-174). Reading, UK: MCIL.

[14] Not surprisingly, it was the journals that tended to publish more established e-government researchers: more than four-fifths of all self-citers were journal article authors.

[15] For example: Burrell, G., & Morgan, G. (1979). *Sociological Paradigms and Organisational Analysis*. London: Heinemann.

[16] Guba, E.G. (1990). The alternative paradigm dialog. In E.G. Guba (ed.), *The Paradigm Dialog* (pp17-27). Newbury Park, CA: Sage Publications; Easterby-Smith, M., Thorpe, R., & Lowe, A. (2002). *Management Research: An Introduction*, 2nd edn. London: Sage Publications.

[17] In a looser sense, there was some tendency towards deductive approaches: 30 papers began with a concept from theory or literature and then tested it with data; only 12 papers adopted a more inductive style of starting with data and then drawing out a concept from that data. There was some support for Raadschelders observation of a regional divide on this: more than three-quarters of quasi-deductive papers were from continental Europe whereas half of the quasi-inductive papers were from the US or UK. See: Raadschelders, J.C.N. (1999). A coherent framework for the study of public administration. *Journal of Public Administration Research and Theory*, *9*(2), 281-303.

[18] Orlikowski, W.J., & Baroudi, J.J (1991). Studying information technology in organizations: research approaches and assumptions. *Information Systems Research*, *2*(1), 1-28.

[19] 48% of papers can be seen to include practical recommendations; 27% of papers are cited by other sources in the ISI "Web of Science" citation indexes.

[20] Easterby-Smith, Thorpe & Lowe, note 16 above.

[21] Benbasat, I., & Weber, R. (1996). Rethinking "diversity" in information systems research. *Information Systems Research*, *7*(4), 389-399, p.394.

[22] We report only first authors here though, for several of the co-authored papers, co-authors came from the same department as the first author. Academic authors outnumbered practitioners by a ratio of roughly 8:1. Practitioners are not included in the table but some were drawn from IT or library/information centre jobs in the public sector.

[23] Numbers add up to more than 84 because some papers (23 in all) drew strongly on two or more different strands of literature. Analysis here related not to the reference list but to items actually used to support the central models, questions or findings in a paper.

[24] Interestingly, writers from governance departments seem much more likely to use IS literature (46% of writers) than writers from informatics departments use governance literature (5% of writers). This may stem from the fact that informatics-department writers seem to use less and a narrower range of literature generally. In turn (see below), this may relate to the writers from informatics departments making little use of models and frameworks, whereas the majority of governance-department writers do make such use.

[25] Where a paper had multiple elements – such as models, concepts and lists – only the highest-level framework of knowledge was recorded.

[26] Sahay, S., & Walsham, G. (1995). Information technology in developing countries: a need for theory building. *Information Technology for Development*, *6*(3/4), 111-124.

[27] See also: Fountain, J.E. (2003). *Information, Institutions and Governance: Advancing a Basic Social Science Research Program for Digital Government*, Research Working Paper 03-004. Cambridge, MA: Kennedy School of Government, Harvard University.

[28] Our definition of literature excluded public sector strategies/laws/policies/Web sites/etc., and instead selected items (journal articles, books, research reports) that could be seen as research literature.

[29] The difference between this and the figure of 33 that appears in Table 2 arises because just over half of those thirty-three only used the e-government literature to support secondary models, or initial questions, or case evidence, or findings; not to supply the central knowledge framework for the paper.

[30] Heeks, R.B. (2001b). What did Giddens and Latour ever do for us? Academic writings on information systems and development. *Information Technology in Developing Countries*, *11*(1), April. The same point has been made earlier about both information systems generally (Swanson, E.B., & Ramiller, N. (1993). Information systems research thematics: submissions to a new journal. *Information Systems Research*, *4*(4), 299-330) and public administration (Harmon, M.M., & Mayer, R.T. (1986). *Organization Theory for Public Administration*. Boston, MA: Little, Brown & Co).

[31] To be included as a 'literature review', we required the method to show some evidence of seeking to characterise and categorise the literature it was dealing with; rather than just picking some points or factors from a few sources.

[32] Myers, M.D., & Avison, D. (eds.) (2002). *Qualitative Research in Information Systems*. London: Sage Publications; Lowery & Evans, see note 8 above.

[33] A further eight papers were counted as not generalising, but that was because they had no recommendations or conclusions.

[34] Fountain, see note 27 above.

[35] These recommendations were quite evenly divided between those at the "strategic" (related to managing e-government for a whole agency or even the whole of government), "tactical-plus" (related to one particular issue that runs across several e-government projects), and "tactical" (dealing with the specifics of an individual e-government project) levels.

[36] Rose, J., & van Rossum, M. (2005). A roadmap for European research in learning and knowledge creation in e-government. In F. Bannister (ed), *5th European Conference on e-Government* (pp343-348). Reading, UK: MCIL, p.347. See also: Dawes, S.S. (2001, May 21-23). *Opportunities for Digital Government Research*. Paper presented at dg.o.2001 National Conference for Digital Government Research, Los Angeles, CA; Fountain, see note 27 above.

[37] For example: Al-Sebie, M., & Irani, Z. (2003). E-government: defining boundaries and lifecycle maturity. In F. Bannister & D. Remenyi (eds), *3rd European Conference on e-Government* (pp19-29). Reading, UK: MCIL; Tian, J., & Tianfield, H. (2003). Some perspectives of e-government. In F. Bannister & D. Remenyi (eds), *3rd European Conference on e-Government* (pp427-437). Reading, UK: MCIL; Gronlund & Horan, see note 1 above.

[38] For simplicity of presentation and language, if no other reason, the authors have assumed in these conclusions a generalisability of findings from the 84 papers covered to the field of e-government research more generally. But one should note some limitations. First, we excluded material from channels such as leading academic journals in referent fields, from e-government magazines (such as *Government Computing* and *Government Technology*), and from the Web. Second, our three sources show some specificities. We did not investigate differences between the three sources in any great detail. Indeed, no

differences were detectable in terms of views on causes of impacts associated with e-government; use of particular research philosophies; and use of particular methods. However, there were signs of some (limited) differences in "research culture" between the three sources:

- As compared to the other two sources, papers in *Information Polity* were: less likely to be written by a practitioner; more likely to be written by someone from a governance department and less likely to be written by someone from an informatics department; less optimistic about the impacts of e-government; more likely to use a higher-level framework or theory; and less likely to have practical recommendations.
- As compared to the other two sources, papers in the *European Conference on e-Government* were less likely to be written by someone citing their own previous e-government publications (i.e. more likely to be written by someone new to the field).
- As compared to the other two sources, papers in *Government Information Quarterly* were: more likely to make use of secondary data; and much more likely to be cited by other authors (19 of the 22 *Government Information Quarterly* papers published before 2005 appear in the ISI "Web of Science" with a median of three citations each; by contrast only one *Information Polity* paper and three *European Conference on e-Government* papers have been cited (once) by other authors).

[39] For example: Landry, M., & Banville, C.A. (1992). A disciplined methodological pluralism for MIS research. *Accounting, Management and Information Technologies*, *2*(2), 77-97, cited in Vessey, I., Ramesh, V., & Glass, R.L. (2002). Research in information systems: an empirical study of diversity in the discipline and its journals. *Journal of Management Information Systems*, *19*(2), 129-174.

[40] We did not subject the choice of e-government topic in each of the 84 papers to any detailed analysis because it was clear that a very wide range of research topics was covered, and that no obviously-agreed priorities emerged. Other papers which do analyse e-government research topic show a similarly diverse range (e.g. Kraemer & Dedrick, see note 1 above; Letch, N. (2001). The emerging e-government research agenda: a report on recent international research. In N. Letch & M. Dixon (eds.), *Proceedings of the 4th Western Australian Workshop in Information Systems Research*. Perth: University of Western Australia. Available at: http://wawisr01.uwa.edu.au/. Accessed July 7, 2005; Gronlund & Horan, see note 1 above).

A review of these reviews suggests four areas of categorisation that can be used to classify the topic of an e-government paper:

- *Application*: which can be divided into e-administration, e-services, e-society or general "e-government" topics (Heeks, see note 12 above).
- *Level*: divided into personal, group, organisation, interorganisation, society and global topics (Flynn & Gregory, see note 8 above).
- *Practice*: divided into infrastructure (data, technology, people, finance), process (strategy, change management, impact), and environment (policy, culture, context) topics.
- *Conceptualisation*: relevant only to those papers seeking to develop some conceptual outputs and which can re-use the continuum of frameworks of knowledge presented above (theory, frameworks, models, etc.) plus additional topic categories such as definitions, and methods.

[41] Benbasat, I., & Zmud, R. (1999). Empirical research in information systems: the practice of relevance. *MIS Quarterly*, *23*(1), 3-16; Gill, J., & Meier, K.J. (2000). Public administration research and practice: a methodological manifesto. *Journal Of Public Administration Research and Theory*, *10*(1), 157-199.

[42] For example: Raadschelders, see note 17 above; Avgerou, C. (2000). Information systems: what sort of science is it?. *Omega*, *28*, 567-579; Kettl, D.F. (2000). Public administration at the millennium: the state of the field. *Journal of Public Administration Research and Theory*, *10*(1), 7-34.

[43] Gronlund & Horan, see note 1 above.

[44] For example: Rademacher, R. (2001). The changing profile of information systems research: 1995-2000. *Journal of Computer Information Systems*, *42*(1), 13-16.

[45] Galliers, R. (1993). Research issues in information systems. *Journal of Information Technology*, *8*, 92-98.

[46] For example: Benbasat & Weber, see note 21 above.

[47] For a discussion of applying the first two to e-government, see: Hudson, J. (1999). Informatization and public administration: a political science perspective. *Information, Communication & Society*, *2*(3), 318-339.

[48] Orlikowski & Baroudi, see note 18 above; Walsham, G. (1995). The emergence of interpretivism in IS research. *Information Systems Research*, *6*(4), 376-394; Benbasat & Weber, see note 21 above; Avgerou, see note 42 above; Gill & Meier, see note 41 above.

[49] As Orlikowski & Baroudi, see note 18 above.

[50] As Walsham, see note 48 above.