

e-Government: Five Key Challenges for Management

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Abstract. e-Government holds the potential to facilitate the complementary use of information systems in government comprising both operational and strategic use. This paper argues that if this metamorphosis is to occur, managers are facing five key strategic challenges: 1) Assessing the demand paradox of e-government. 2) Ensuring that gate-keeping mechanisms of the street-level bureaucrats are not eroding the dynamics of e-government. 3) Use of IT to decrease the high labour intensity in public service provision. 4) Revisiting the employees' readiness for e-government. 5) Building competences within government to ensure dynamic use of IT.

Keywords: e-government, strategy, management, demand, entities, gate-keeping mechanisms, labour intensity, readiness, competence

1. Introduction

The quest to implement e-government is motivated by policy goals of increased effectiveness, efficiency, and information quality, improved interaction mechanisms, and in turn better governance tools (Grant 2005; Gronlund 2005). In this paper we address the role of management in achieving these goals within the realms of public administration by discussing what are the key challenges management faces beyond providing the technical infrastructure and facilitating the standardization procedures. Although interoperability and data integration are vital elements for implementing e-government, there is a danger in focusing on digitalization of the governmental organization. In this paper we argue that there is need to view the users of the public services as digital entities rather than physical entities and consequently align their e-government application towards the external users rather than the in-house needs. If this view is adopted, there are surfacing five key strategic challenges discussed and exemplified in this paper: 1) The demand paradox of e-government. 2) Gate-keeping mechanisms of the street-level bureaucrats. 3) High labour intensity in public service provision. 4) The employees' readiness for e-government. 5) Building competences within government. In the paper, we explore and make management propositions for each of these challenges. The e-government wave with extensive use of URLs, virtual workspaces, e-mail, instant messaging, SMS and blogging might not bring about any fundamental new mechanisms in government (Bretschneider 2003; King 2003). Yet, it is our proposition that management is challenged to move away from a transactional view of IT to a more strategic view of IT adoption in government (Stamoulis 2001; Affisco 2006). Although strategic challenges for e-government share many challenges with the diverse set of e-business challenges facing the

private sector, there are at least three reasons to be concerned with e-government per se.

Firstly, IT in government follows essentially a budget driven approach and is by most means facing demands of a much faster pay-back time than the private sector. Government will often have to finance its spending on IT on current accounts and not be able to argue that investment in IT will lead to reductions in transaction costs etc. on the longer term.

Secondly, in the private sector, the business-led approach to identify useful and strategic vital technology argues that IT can be a strategic weapon in the competitive market against intruding companies and substituting products, strengthening the supply chain power, and enhancing markets (Willcocks 1997; Porter 2001). It is our proposition that government is yet to adopt a market strategic use of IT.

The third reason to address e-government management challenges is the societal importance of IT in government. Strategic use of IT in government can have a critical impact on the private sector, for example, the ability to communicate electronically with import/export licensing boards, as in the Singapore tails (Neo 1995; Ke 2004). The citizens could be impacted by government strategic moves to eliminate physical communication channels in government, allowing only online communication.

2. From cultivation to penetration

The vast investments and implementation of fiscal impact budgeting systems in local government and macro-economic models during the 1970s and early 1980s did break new grounds in the operation of government. The expert operated technology (often remote mainframes and terminals) gained quick momentum due to its number crushing capability. Studies surfaced on

the social analysis of computing and the role of computing in political decision-making and management challenges. It was seen as a tool that could lead to experts or politicians gaining power and could increase consensus building or be part of partisan politics, and lead to centralization or decentralization of government (Dutton 1985). The shift in technology by gradually replacing terminals with PCs during the mid 1980s to mid 1990s, brought about a new group of users, namely the non-IT expert users. Parallel to this diffusion, research issues surfacing on issues, such as automating democracy and the policy segments, are concerned with the changed pattern of discretion within areas such as police reinforcement and social welfare workers. While IT was still used in-house during this period, it was the first step in the gradual shift towards IT-use in the citizen and company oriented communication, steering away from a pure policy input and planning mode (Snellen 1994; Ingelstam 1991).

During the mid 1990s and until the early stages of the new century when e-mails and URLs became an inherent part of the modernization of government, the government applied IT to increase effectiveness and efficiency and information quality. Despite the technological advances in government, there is great uncertainty as to what type of services are in demand for online services, the extent to which IT is transforming public administration and politics and who is benefiting from the changes that are occurring. Indeed, in contrast to those who proclaim that IT has transformed government, there are counterclaims that IT has largely been adapted to and reinforced by existing behaviors and practices. In this view, IT is merely one more resource for managers (Danziger 2002; Andersen 1998). Although we agree with this position, management of e-government faces, if not new, then a more diverse set of challenges of record keeping and in-house rational decision-making control; additionally, it enables an anarchic flow of information and decision-making within virtual organizational forms.

Table 1: Major shifts in use of IT in government

Label	Period	Key technology	Use of technology
Cultivation	1970s-early 1980s	Terminals Centralized solutions	Experts Segmented use In-house use
Seeding	Early/mid 1980s-early 1990s	Micro-computers Distributed computing EDI	Desk-top use Administrative systems diffused General use
Extension	Mid 1990s-	Internet	Transactional view

	early 2000		Predefined and standardized services
Penetration	Present	Mobile computing WIFI Access points	Shifting ownership to external users Digital entities

In Figure 1 we have pictured the move from the closed and in-house communication patterns towards penetration of the organizational membrane through shifting ownership to external users and viewing the users of the public services as digital entities. At the organizational level, we find various indicators of blurring organizational boundaries. Situation C captures that various IT applications, including mobile technologies, are already part of the process penetrating the organizational membrane of the public sector. Yet, IT follows predictable and controllable patterns with regards to the access and transparency of the decisions and the service development. The captivating situation is when organizational actors use IT to support work processes in rather random ways. Also, the nature of the work processes that are supported, enabled and created by IT, changes from following a known and controllable pattern to a diverse, chaotic, and uncontrollable pattern, and the demand side communicates in an incremental and ad hoc fashion rather than in a constant and planned manner. This development is illustrated in D.

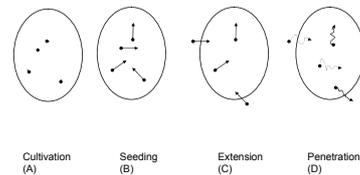


Figure 1: IT in government: from cultivation to penetration?

Source: Adopted and modified after Andersen, Upkar and Fogelgren-Pedersen Anderson (2003).

The penetration phase challenges those who advocate that e-government is all about law and building information systems along the formal organizational structures. Situation D replaces the formal view of government with a set of dynamic and modularized digital devices for recording, accessing, and exchange of data, information, and knowledge across distances. Furthermore, situation C assumes that there is free entry, exit, and voice for the users and the marginal transaction costs for the services approach to

zero. Abandoning the intranet could be one consequence of this line of strategic thinking on IT in government. We do not argue that the intranet cannot serve rational objectives. Indeed the sharing of data within government and the ability to transform data from one person to another in a digital format and keeping these in digital format once stored is a key feature and advantage using the intranet, data bases, and various ERP-systems. The danger is that the focus is being attributed to maintaining the intranet, that more energy is spent on defining boundaries than delivering services, and that the orientation of the activities is being instrumentalized in self-assuring routines that hardly, if ever, are transparent or involve external users of the public services.

Penetration of the organizational membrane is hardly a valid description of how e-government is structured today and may not be a representative picture of what all governmental organizations may look like in the near future. Yet, we do claim that the marginal changes in e-government will be more correlated with penetration of the organizational membrane than strengthening intra- and intergovernmental standards and network. The possible biggest misperception about e-government is the image that e-government is an end in itself and that the objectives are globally applicable, in a uniform manner. In the work with management training, such a proposition is of little use.

3. Digital entities

The normative implication of the shift in e-government outlined in the previous section is that the IT-adaptation strategies will be more, but not exclusively, demand oriented in the sense that it is the customers that direct the activities and the way technologies are used in e-government. Using IT in government as an in-house and intergovernmental venture encourages enabling direct and real-time interaction with users. A fraction of this communication will be highly structured, predictable and essentially controlled by the supply side, such as building permits and car registration renewal forms. The major portion of e-government communication will not be within government and will be hard to predict when and where it will come from. Standard protocol for answering correspondence and archives for storing communication is under pressure. The new generation of applications, such as SMS, chat, and virtual collaboration technologies, alters the way communication takes place.

The external user orientation has met objections by, for example, Fountain (2001) who argues that adoption of a customer service view might lead to

increased political inequality by bucketing resources to the services in marked demand. While we acknowledge that this argument can hold validity, there might be a need to examine whether this argument is proposed more as a projection of the public sectors' inability to adopt and perform in the new media environment. The transition to viewing users as digital entities is not only a management challenge. Also, major challenges will occur for the technical development. Government will need to rethink new applications and to consider the out-phasing of existing applications towards the external users. Also, radical initiatives such as substituting intranet and physical communication channels with Internet applications will require assessment of the employees' readiness and the ability to reduce the high labour intensity in the public service provision.

The external user orientation will imply that government formulates visions for online communication as the norm and the keystone in government, and not as the exception. Although countries as Singapore has infused government with IT and by most measurements more advances than many other countries, creation of digital profiling for the citizens is yet to occur. The strategic thinking of e-government is still by far an institutionalized project. We propose that a trigger for changing this could be to adopt the view proposed by Yang (2003):

"To achieve the great transformation made possible by IT, public administrators' strategic choice, initiative, and entrepreneurship are necessary...public administrators must have faith, be optimistic, and act strategically."

One implication for public managers of adopting this proposition is to focus decision-makers and customers by perceiving them as digital entities with a physical presence, rather than the reverse. In an executive training session for executives from the social welfare area taught by the author of this paper, the participants had substantial objections to the proposed digital view of users. Their view was that certain groups of society (the disadvantaged) and certain public services were not suitable for digitalization and would in the end do more harm than good to the policy objectives of the area. Clearly this argument has political merit and has been addressed in several national policy plans as well as in the international debate forums such as the World Summit of Information Society. To counterbalance the argument, we asked the participants in the session to reflect on the fundamental difference between the process and activities involved in the social welfare services and, for example, home banking, book ordering, and travel booking.

4. Strategic challenges and actions

Viewing the users and employees as digital entities has, as acknowledged above, substantial political and ethical challenges. Leaving this aside here, we concentrate on the management challenges related to the implementation of this view. We propose five key challenges facing e-government management: 1) confronting organizational activities with the fundamental demand paradox of government, 2) accessing the mechanisms of gate-keeping within the organization to help reduce the new generation of digital gate-keeping, 3) use of IT to reduce labour intensity in service production, not increasing it, 4) critical assessment of employees' readiness for e-government, and 5) enabling and renewing competence building mechanisms for the new media use.

Table 2: Strategic challenges for e-government

Strategic key challenge	Proposition
Demand paradox	Costs for online presence and explicit visions for whether the associated costs should be seen as operating costs and a need for centralization in decisions on how and where IT is being adopted
Gate-keeping	Implementing e-government visions with respect to queuing, routines, time allocation, and psychological barriers.
Reduction of high labour intensity in service provision	Complementing the digital wheelbarrow view of IT with a vision on how to reduce the labour intensity in service provision.
Assessment of employees' readiness	Reorganizing the division of labour from the individual cases solved rather than simply following the existing organizational conventions.
Competence building mechanisms	Envisioning how competence building for government workers should evolve. Piloting of reward mechanisms for competence building using IT

4.1 Confronting the demand paradox

The first strategic challenge concerns the costs for online presence and the associated demand paradox. Contrasting the private sector, government in general cannot use IT to expand its sources for revenue or shift to more profitable products/customer segments. As accessibility to

the Internet is approaching 100% at both the supply side (the government) and demand side (the citizens and companies), there needs to be more explicit direction for whether the associated costs should be seen as operating costs only and if so, whether they should be taken from other areas. Will this reinforce a need for centralization in decisions on how and where IT is being adopted? Government has, intentionally or not, created the expectations that through the online universe, citizens can expect the same service mentality from the public sector as from the private sector. Prompt replies, traceability, etc., are key expectations being raised: where does this begin and end? From one perspective, one could fear an endless demand of governmental services in the online universe with no transaction costs from the citizens' point of view.

In its transformation to being online, government has not been clear about how it is going to handle the success. At a workshop in Europe, one of the presenters from the Ministry of Finance in a country considered to be among the worldwide leaders of IT-adoption reported:

“When we designed this website for the citizens we downplayed the usability part not because we couldn't do better or were not aware of this. We were exactly aware [of] that a too good design would cost money on two ends: we would have to pay the consultants and software company more and we would end up having increased workload.”

The lack of budget line for increasing expenditures by going online and higher requirements for instant payoff of IT expenditures in the public sector than in the private sector are issues that will accompany the concerns raised by the manager from the Ministry of Finance and will be increasingly relevant to address the more the organizational membrane is penetrated.

4.2 Gate-keeping

Janus, the Roman God of doors and gates, had two faces, one looking ahead and one looking back, representing that a door can let you in or let you out. In the era of e-government, Janus-mechanisms can be positive through top-down policy formulation helping set principles and taking action that helps ensure that government does service those in need (and not just the people asking). e-Government could be viewed as part of the new public management wave seeking to

“emphasize efficient, instrumental implementation of policies, removing substantive policy questions from the administrative realm. This revival of the politics-administration dichotomy threatens

core public-sector values of citizen self governance and the administrator as servant of the public interest” Box (1999).

Formulating policies for access control is a key strategic challenge. Equally crucial is the need to be aware of the bottom-up evolving gate-keeping mechanisms for queuing, routines, time allocation, and psychological barriers that end-users and managers face when attempting to have street-level bureaucrats implement e-government visions. While the gate-keeping literature has addressed gate-keeping in the realms of advocating an understanding of implementation of policies from the “bottom-up” of the public sector organizations rather than from top-down (Lipsky 1980), gate-keeping is a strategic challenge here and is viewed as an area to address from a source that could hinder implementation of the overall policy goals.

To illustrate this point, we asked a class of students enrolled in the Executive Masters Program of Public Administration at Copenhagen Business School to write a list of ways of avoiding work using IT (see Table 3). The students, all having management or staff positions in the public administration, saw e-mail as the key information technology to avoid or help getting work done. There were only sporadic talks about instant messaging and blogging. The students showed great creativity suggesting using incompatible software and having the mail client crash. Also, having automated reply, forwarding to office mates and using quick and short replies. The managers, however, showed also great creativity in using IT to help them getting others attention to their work and ensure that their piece is processed. The managers would use BCC and CC of e-mail as tactical weapon and pressure the colleague or citizens to respond. How to use IT to avoid work

- Standard reply form/ Vacation/ out of office message such as “Do not disturb me now, please. I am working on a serious task that allow no disturbance or interference by any digital means”
- Chose special software and hardware
- Forward mail (and ask for additional work) or circulate advanced spread sheets asking colleagues to key in information
- Mail program crashed – no back up. A virus program hit my e-mail program.
- All incoming mails were automatically marked as read
- I got your message, but my inbox was floated
- Quick, but short, reply (just in header)

- Cancel participation in the meeting and ask the organizers for a written summary/minutes of the meeting
- Sorry, I was at my MSN...Have at least five digital connection points and your clients/ customers will trace you from one point to another.
- Send the message: Thank you for your e-mail. Since I am not in office at the moment, I kindly ask you to consider the necessity and urgency of the mail. If you are able to complete the task without my assistance/approval, it would ease my workload substantially. Thank you in advance

4.3 Reduction of high labour intensity in service provision

The third strategic vision we propose is to complement the “digital wheelbarrow” view of IT with a vision of how to reduce the labour intensity in service provision. Applying IT in the public sector is about reducing costs of sending, storage and retrieval of information. The strategic challenge is finding ways of exploiting IT to reduce the high labour intensity in service production. Self-service through the Internet has been a key initiative to achieve this, but the reality is that most governments are looking for users in areas where they are not most likely to be. Clearly government has been successful in areas such as internet based tax forms. Online visa forms are another example as in the case of Australia and are currently being prepared in Bhutan. By reducing the cost of the visa processing, resources could be reallocated to other parts of the public sector.

As appealing as this argument might be, the downside has been that digitalization has been approached as relevant for the support activities only. Instead, we argue that attention should be directed to all parts of the public sector activities and, in particular, to the core activities since they have been left out of digitalization. The next strategic wave will have to examine visions for how government workers can benefit from IT. This will mean adoption of a complementary view of what we have labeled the digital wheelbarrow perception of IT. Government has been focusing almost exclusively on the administrative costs of government, or what Porter labels supporting activities. The challenge identifying the potential for reduction in labour input in service production is that the end users are intertwined in both design, processing and use of the service (Fountain 2001). Areas such as education and social counseling are profound examples of the inherent problems in reduction of labour input without doing serious damage to the core service. The argument often put forward is that as

appealing as technologic centric charts of e-government might be (and there is a need for better technology training of the governmental work force), there is a danger that neither government users nor researchers are benefiting when focusing exclusively on the technology component. Clearly, there is a danger in focusing on technology and throwing out the research insight on the interplay between technology and organizations provided continuously throughout the 1970s, 1980s, and 1990s.

Yet, it is an even bigger strategic mistake to stop searching for information that can be digitized. In management training we have gained some success by rephrasing the question. Instead of asking the participants what can be digitized, we ask them to address the question of what cannot be digitized. This rhetoric trick helped the public managers to start looking at the least likely areas, such as education, social counseling, and law enforcement, rather than focusing only on the most-likely cases of computerization of administrative areas.

4.4 Employees' readiness for e-government

The fourth strategic vision reorganizes the division of labour from the individual cases solved rather than simply following the existing organizational conventions. There is a need to carefully address how we envision case workers communicating with citizens and companies. By going online, government has, by and large, replicated the existing division of labour. From a strategic point of view, there is a need to refine the online presence by outlining what competences, data, etc., are necessary in order to solve the problem/issues at stake from the customer's point of view. We propose that having a spectral strategic analysis ranging from viewing public employees being pro-active and eager to implement IT as a mean to substitute routines and jobs and moving towards viewing public employees from an obstructionist viewpoint. The latter will represent a picture of the public sector as a unity of workers that will use any means to prevent direct digital contact with users and citizens. The spectral analysis will help to "...balance between agent and institution, between strategic choice and institutional constraints" (Yang 2003).

In executive training we have asked participants to express their view of the organizational readiness for e-government service provision through the lenses of the Ackoff (1974) (see Table 5 below). There was systematic positive bias on the managers' assessment on their employees'

readiness by viewing them as being proactive and interactive, rather than inactive and reactive. The findings of the employees were the direct opposite. While most of the employees viewed themselves as having a high ability to adopt to changed situations and needs, none of them viewed themselves or their colleagues as being interactive.

Table 3: Managers assessment of employees' readiness for e-government

Change	Passive	Active
Planned change	Inactive "management by crisis"	Proactive "imitator"
Situated change	Reactive "dynamic conservative"	Interactive "visionary"

4.5 Competence building mechanisms

The fifth strategic element is a critical re-visit of the patterns of competence building and the role that IT plays in this. If communication patterns with the external users are to become multi-application based, employees will then face the challenge of mastering multiple applications as a dynamic condition. There is a strategic implication for formulating views on how competence building for government workers should evolve. The management jargon insisting that IT is 80% organization and 20% technology has –in our view– unfortunately had devastating impacts on technological qualifications. Endless numbers of seminars on strategy, organizational strategy, organizational learning, and total quality management seminars have been attended by the public sector.

As much as we support the value of such seminars, governmental workers are in general left on their own with regards to technology adoption. Most workers haven't been systematically trained since the days of WordPerfect 6.1, Lotus 1-2-3 and DOS - at best since the introduction of Windows 3.2. Qualification schemes have been individualized due to plug and play programs, straightforward user interfaces and data and document sharing servers and folders. This is contrasted by, for example, the financial sector, where training is performed through the application of IT in what has now been labeled e-learning environments. With respect to the public sector's use of IT for enhancing their core capabilities, examples are scarce and rarely to a level where, for example, case work is accessed in digital format for learning purposes.

We suggest short upgrade modules of, for example, two hours and, most importantly, to

abandon all training during the day-time for public servants and replacing it with after-hours training, predominately through digital media. This would help increase time spent on core-activities and help increase the overall IT-competence level. Clearly this shift should be accompanied by appropriate pay schemes for increased competencies. Assuming 10% of the work time is spent on training, transferring this to after work hours would free financial resources that could be used to increase salaries. This would link the increase closely to increases in productivity that occurs as a result of the increased training after work hours.

In an experiment we carried out, we asked public managers to undertake a chat session addressing the up-take of the Internet in their work activities. The most striking thing was that the managers started by defining what they should deliver and in what format. There quickly emerged a "leader" of the discussion, and throughout the session they had a stick-to-the-point argumentation style. Tragically, the session did not come up with any usable input that is, input that could not be readily found at any standard consultancy report. This chat behavior is contrasted by the younger generation that does not stick to the point, does not have a leader of the pack, but is creative and less concerned about the writing style and the output documentation. We believe that this will set the standard for communication between the coming users of the public sector services.

5. Conclusion

The management transition from the operational view of IT to a strategic vision for e-government is discussed in this paper in terms of the penetration of the organizational membrane. The strategic visions were anchored with respect to challenges within coordination, interaction, and organizational control for e-government. Asking managers to formulate visions for how to solve the demand

paradox can end up being cost drivers if the costs for ensuring full IT integration and one stop services are not accompanied by reduction in other costs. We highlighted the need to be aware of "digital" gate-keeping mechanisms and take actions that help realize the visions of e-government by viewing the implementation more as a bottom-up implementation. The implication of this would be to critically assess the mechanisms of gate keeping and network-mechanisms. There has been almost no attention placed on the use of IT not only as substitutional technology, but also as a complementary means to competence building. Managers need to critically assess their employees IT competences and consider whether the existing mechanisms of adopting new technologies are likely to ensure adoption of technologies such as SMS, chat, blogging, etc.

Clearly there are areas beyond the challenges discussed in this paper that need further attention. A key concern in moving towards penetration of the organizational membrane is security with regards to securing wireless e-mail, minimizing loss of data, securing handheld access to the government network, and deploying and managing security policies for many devices. Although each of these concerns has merit in most government management boardrooms, they could also reflect a convenient scapegoat for not focusing on the e-government opportunities and the associated management initiatives.

Government is at a crossroads whether to enforce control of information access and processing. While the Ministry of Finance, in general, takes the position of controlling not only information access and processing in order to avoid demand driven budget increases, it also advocates outsourcing to third-parties. This leads to policy challenges such as accepting that social security payment processing for citizens of Oklahoma is done in India.

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e-Local Government in New Zealand: The Shifting Policymaker View

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Abstract: The New Zealand government has a strategy in place to establish an e-government infrastructure that is intended to allow citizens and government agencies to interact electronically. This paper reports the results of a longitudinal study designed to track the development of e-local government initiatives in New Zealand since 2000. Identical surveys conducted four years apart show heightened recognition by policy makers of sixteen key policy issues judged vital for e-government success; as well as increasing sophistication of local authority websites. The results also indicate that, while the majority of NZ e-government websites appear to have been created to provide information to citizens, there remain many opportunities to use such a vehicle strategically. It is anticipated these results will be of interest both to local and central government policy makers, and to other e-government researchers.

Keywords: governmental issues, e-government, local government, policy

1. Introduction

Although governments around the world administer a diverse array of services, long recognised is the potential for a common range of such IT-enabled activities. (Leach and Stewart, 1992) In New Zealand (NZ) the introduction of information and communication technologies to all aspects of government is now a priority, with electronic government (e-government) generally believed to be a cost-effective use of new technology to provide people with convenient access to government information and services, to improve the quality of services and to provide greater opportunities to participate in the democratic process. (NZSSC, 2003). The study of e-government has emerged as a distinct, multi-disciplinary research field in its own right. Within this field a particularly fruitful and worthy subject for investigation is the nature of developments in local e-government initiatives and the commensurate impacts on citizens. It is important to track progress towards a totally seamless e-government so that a level of consistency and appropriate control might be achieved, and with equitable services provided to citizens through the various interacting government agencies. This study contributes to such monitoring by presenting a longitudinal record of the evolution of e-local government in NZ. A comprehensive questionnaire was sent to every NZ local authority in December 2000, and again in December 2004. At one level the survey was designed to reveal the sophistication of local authority websites in terms of the features they contain; another level sought to understand the rationale behind the web sites in terms of the formal and informal policies guiding their development.

By comparing longitudinal survey results it was possible to gain an appreciation of the nature and speed of evolution of e-local government in NZ, and to highlight areas of improved sophistication and performance that should be promulgated to policy makers for their own consideration. It is anticipated these results will be of interest both to local and central government policy makers, and to other e-government researchers.

2. Theoretical basis of research

Since 2000 a wealth of data has become available with which to compare e-government performance at the national level, e.g. (Basu, 2004; Teicher and Dow, 2002; Griffin and Halpin, 2002; Turner and Higgs, 2003; Ke and Kee Wei, 2004). This data consistently indicates that progress is being maintained in many areas, although global development is somewhat piecemeal and can be inconsistent. For example, in Australia, e-government service is largely focused at information-only provision and its spread is uneven, especially in rural and remote areas. Australia, like NZ, has a low-density population and its rural citizens have different needs to those of city dwellers, e.g. Teicher and Dow (2002). Teicher and Dow also reported that Australia in 2002 had a proliferation of portals, rather than a desirable single entry point to government organisations and entities. Similarly in the UK, while some local government websites demonstrated significant levels of sophistication, the majority were still at an emerging phase. (Griffin and Halpin, 2002).

Singapore might be considered the perfect geographical setting for e-government, having a compact landmass of just 640 square kilometres.

Indeed it was one of the first countries to develop an integrated and coherent approach to computerising its government (Ke and Kee Wei, 2004), and is currently working towards customisation of its service to enable one-to-one relationships between government and citizens. Like Singapore, NZ has long been considered a good performer in terms of its e-government activities. A 2001 survey of the proportion of (central) government sites with fully online services, indicated that NZ (with 48 percent) was placed fifth, behind first-placed Taiwan (65 percent), but well ahead of the higher profile e-governments of the USA (34 percent) and the UK (30 percent). (Global E-Government Survey, 2001). E-government can be considered a disruptive technology (Christensen, 1997) and a major challenge is how to measure the progress of its implementation. (Noordegraaf and Abma, 2003)

For example it is questionable whether citizens, who are the primary stakeholders, even have the skills or would be willing to measure e-government progress. (Griffin and Halpin, 2005) From an extensive review of the US-based literature the authors developed a framework that captured the major e-government issues, and this framework underpinned the 2000 survey instrument. (Deakins et al., 2001; Deakins and Dillon, 2002) While acknowledging that other countries also have a huge amount of e-government literature and resources, such as the Australian Government and Information Management Office (AGIMO) (<http://www.agimo.gov.au>), the USA was chosen because of its advanced state of e-government at the time, and its dominance of the e-government literature.

The developed framework, which is shown in Figure 1, comprises sixteen key issues that must be addressed by e-government policymakers if e-government is to be successful. These issues were grouped into six related areas: Worth, Access, Relationships, Regulation, Protection, and Societal. Further investigation revealed that a number of these areas required modification for the NZ environment: Access (Accessibility, Digital Divide, Indigenous Peoples), Relationships (Consumer Confidence, Private Sector, Trust), Regulation (Taxation, Legislation), and Societal (The IT Workforce).

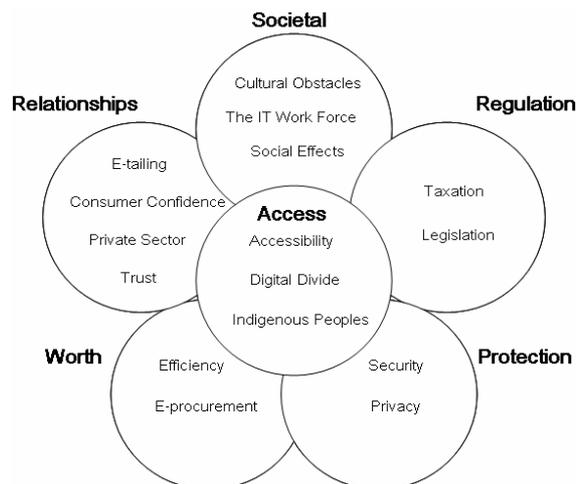


Figure 1: Key issues for the creation of e-government in the USA (Deakins et al., 2001)

3. Research methodology

NZ is administered at the regional and local level by 86 administrative bodies. Twelve regional councils are responsible for resource management, biosecurity, catchment control, harbour administration, regional civil defence, and regional land transport while the remainder, being city and district councils, are concerned with community well-being and development, environmental health and safety and infrastructural services such as sewerage, water, roading, etc. In 2004, as in 2000, a mail survey was formed around the 16 identified issues and sent to the Chief Executive/General Manager of every regional and local authority in NZ.

The purpose of the study was outlined to each addressee, who was asked to forward the survey to the individual within the organisation with the most direct involvement in e-government policy development. Such development is likely to involve determining how information-based services (predominantly) might be enhanced through website and e-commerce technologies. Reminders were sent after three weeks if necessary. In the first survey in 2000, 49 usable responses were received from the 86 local and regional authorities contacted, representing a response rate of 57 percent. In the second survey in 2004, 51 usable responses being received, which equated to a slightly increased response rate of 59 percent.

4. Results

4.1 Key demographics

Table 1 provides a demographic comparison of the survey respondents.

Table 1: Population demographics

	2000 (%)	2004 (%)	Change (%)
No. of employees			
0-59	33	30	-3
60-100	16	19	+3
>100	51	57	+6
Population base			
0-50,000	64	62	-2
50,001-100,000	12	14	+2
100,001-200,000	10	10	0
>200,000	14	14	0
Annual expenditure (NZ\$ million)			
<10	8	15	+7
10-50	74	55	-19
51-100	8	20	+12
>100	10	10	0
Website expenditure (NZ\$)			
<5,000	54	12	-42
5,000-9,999	14	17	+3
10,000-50,000	21	48	+27
>50,000	11	23	+12

It can be seen that the size of local and regional authorities has generally increased (number of employees), -perhaps in line with the population bases of the participating authorities, which has shown a similar upward trend. In 2000, 74 percent of participating authorities stated that their annual (total) expenditure was NZ\$10-50 million and this proportion decreased to 55 percent in 2004. A higher proportion of smaller local authorities participating in the 2004 study can perhaps explain such a marked change, which is accompanied by an 88 percent increase in authorities claiming annual expenditures of less than NZ \$10 million. The dramatic increase in the number of authorities in the NZ\$51-100 million annual expenditure range can also perhaps be explained by similar variations in the demographics of the (responding) authorities. In 2000, 8 percent of local authorities were still developing their website and 69 percent of responding local authorities had a live website. Four years on and 96 percent of NZ local and regional authorities reported having an operational website. The website expenditure figures are particularly interesting since it might have been expected that a large one-off investment to establish an e-government presence would be followed by reduced ongoing website maintenance costs. In reality, the proportion of local authorities spending less than NZ\$5000 per annum has dropped to 12 percent (from over 50 percent) while those spending more than NZ\$10,000 has more than doubled, from 32 percent to 71 percent.

4.2 Website features

Both surveys required the respondents to report the presence of 21 ideal e-government website features that were based on criteria from The Oultwood Local Government Web Site Index (Oultwood, 2000), which synthesises the best features of local government websites across Australia, Canada, Eire, New Zealand, South Africa, the US, and the UK. Table 2 shows the percentage of NZ local authority websites where a feature is reported to be present.

Table 2: Website features

Ref.	Feature	2000 (%)	2004 (%)	Change (%)
1	Search engine	59	100	+41
2	Council's responsibilities	85	100	+15
3	Downloadable documents and forms	85	100	+15
4	Local panoramas/aerial photos	44	92	+48
5	Site navigation help	47	92	+45
6	Events diary	65	92	+27
7	Frequently Asked Questions (FAQs)	32	85	+53
8	Local tax collection	3	69	+66
9	Web-visitor survey	24	69	+45
10	Fast loading web pages	76	69	-7
11	Press releases	79	69	-10
12	Highway web cameras	6	54	+48
13	GIS (mapping)	21	54	+33
14	Minutes archive	38	54	+16
15	Simple web pages	88	50	-38
16	Virtual tours	6	38	+32
17	Telephone directories	47	38	-9
18	Library catalogue, reservation, renewal	18	33	+15
19	Cemetery index	3	31	+28
20	Online bill payments	0	15	+15
21	E-tailing	3	0	-3

These values are also represented graphically in Figure 2, where increases in most of the desirable Oultwood features can be readily appreciated. For example, every responding authority reported the presence of a search engine, a description of their responsibilities and downloadable documents and forms. Other features (Ref. 4 – 6 in the table) are

also present on the majority of sites, with the most significant increase since 2000 being websites featuring local tax collection (3 percent in 2000 rising to 69 percent in 2004). This was expected, as over 20 percent of respondents without a website in 2000 stated that tax collection was one of the intended features of their planned site. (Deakins and Dillon, 2002) Given these

respondents were also the late adopters, it is unsurprising that the others too have begun to collect tax revenue via their websites. Although the specific nature of the tax (or rates) collection is not known it indicates a strong development in terms of transactional activities now occurring via NZ local authority websites

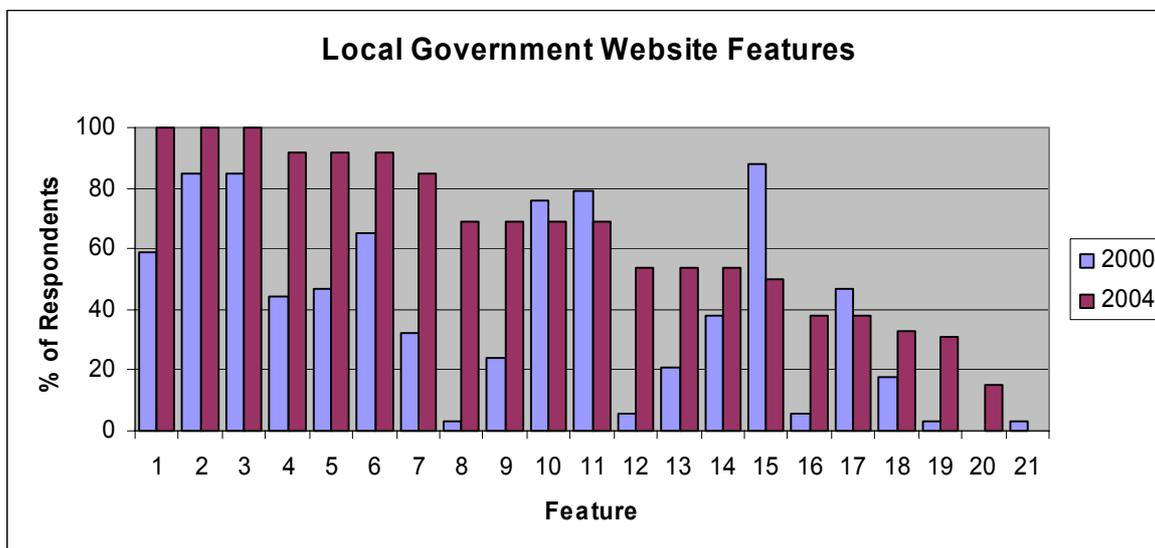


Figure 2: Local government website features

4.3 The policymaker’s view of e-government issues

In this section the significance of each of the sixteen key e-government issues identified in Figure 1, is evaluated through the eyes of the Local Authority e-government policymakers. Statements in the survey generally took the form: “Please indicate [on a 6 point Likert scale, with anchors: 0 = Don’t know, 1 = Not at all, 3 = Somewhat, and 5 = To a Large Extent]... the extent that you would consider [Issue] when developing or maintaining your website.” An intention of the first study was to assess the level of knowledge respondents had of the sixteen key issues; hence, respondents were not given definitions of a number of e-commerce-related terms (such as Digital Divide, E-procurement...) and were asked to respond based on their current level of understanding of such terms. Expectation of a reasonable understanding of terms and issues was not well supported by the results in 2000. For example, 17 percent of respondents were unfamiliar with the term ‘E-procurement’, 20 percent appeared unfamiliar with the term ‘Digital Divide’, 17 percent were unable to relate the issue of ‘Taxation’ to their own e-government initiative and, similarly, ‘E-tailing’ was not understood by 14 percent of respondents. In the 2004 survey, respondents were provided with clear definitions of a number of e-commerce related terminologies to avoid confusion when answering the survey.

4.3.1 Issues of worth

By 2000 many businesses, government authorities, and citizens had already agreed that e-commerce could improve Efficiency in government departments by providing citizens with relatively inexpensive, real time access to consistent transaction facilities. This view is confirmed in Figure 3a, which shows that a key reason for respondents wishing to have a website is the gains in efficiency that it will bring (the lightly shaded bars are the values for 2000). In 2004 this trend continued, with even more local authorities appreciating the potential efficiency gains of an e-commerce website.

Similarly, developing an e-government presence can save time and money through the adoption of E-procurement, which creates the potential for savings on bulk purchase pricing and transaction costs. Figure 3b shows that, in 2000, approximately 14 percent of respondents were unaware of these e-procurement advantages. Even in those cases where an understanding of e-procurement was signalled, only 53 percent indicated that they rated its significance as being ‘Somewhat’ or higher, i.e. rated the extent they would consider it when developing or maintaining a website. In 2004, Figure 3b indicates that approximately 9 percent of respondents may still be unaware value of e-procurement benefits.

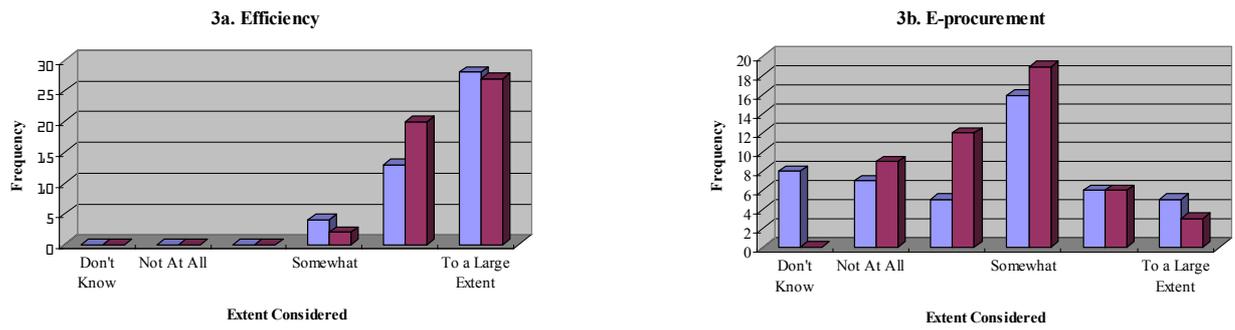


Figure 3: Worth issues

4.3.2 Issues of access

Regardless of central government initiatives, e-government will only be successful when access to the Internet is widespread and available to every citizen. In the 2000 study, accessibility was felt to be a significant issue when developing and maintaining a Local Authority website, Figure 4a, and there was a growing awareness in 2004. In 2000 there was a wide range of opinion on the subject of the Digital Divide although 80 percent of respondents claimed to understand the issue. At the time this was thought to be indicative either of socio-economic differences across the districts served by the Local Authority or differences in bandwidth availability, Figure 4b. By 2004 around

5 percent reported that they did not understand the Digital Divide concept, and with a further 55 percent or so of respondents being conscious of Digital Divide issues impacting e-government accessibility. It is desirable that local governments are aware of indigenous peoples' difficulties. While 74 percent of respondents did rate this as being of 'Somewhat' or higher significance in 2000, a clear majority of respondents indicated that they rated the needs of Indigenous Peoples as being only of 'Somewhat' significance, Figure 4c. Although 67 percent of respondents in 2004 rated this issue as being of 'Somewhat' or higher significance, overall there remains a mixed picture of its recognition.

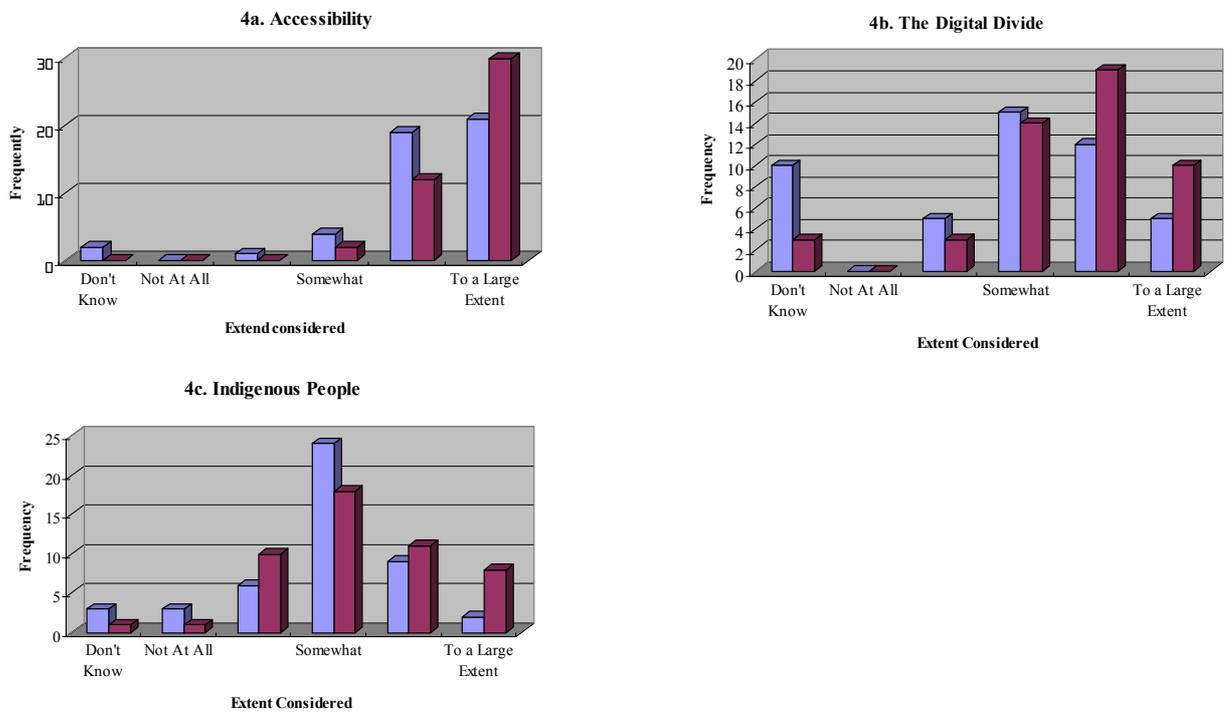


Figure 4: Access issues

4.3.3 Issues of relationships

Ultimately, the NZ government wishes to have partnerships with businesses in the Private Sector because globally this is the area in which electronic retailing (E-tailing) is growing rapidly. It was interesting that, in 2000, both a lack of understanding of E-tailing and an overall low significance rating by respondents was noted, Figure 5a. The 2004 values indicate that many respondents still lack understanding of e-tailing although this is showing some signs of increasing. Similar to the USA position, the NZ government has much to gain from obtaining the support and feedback of businesses in the Private Sector

before e-government services are implemented. Figure 5b indicates that 48 percent of respondents rated the significance as being ‘Somewhat’ or higher in 2004, a significant increase over the 2000 situation. Consumer Confidence and Trust in performing online transactions is critical to the success of this new commerce medium. Figures 5c and 5d both confirm the view that consumer confidence and trust were, and remain, significant issues for Local Authority policymakers when they implement and maintain a website. Sensitivity to these issues may also be a reflection of the ‘public good’ environment in which local government staff operates.

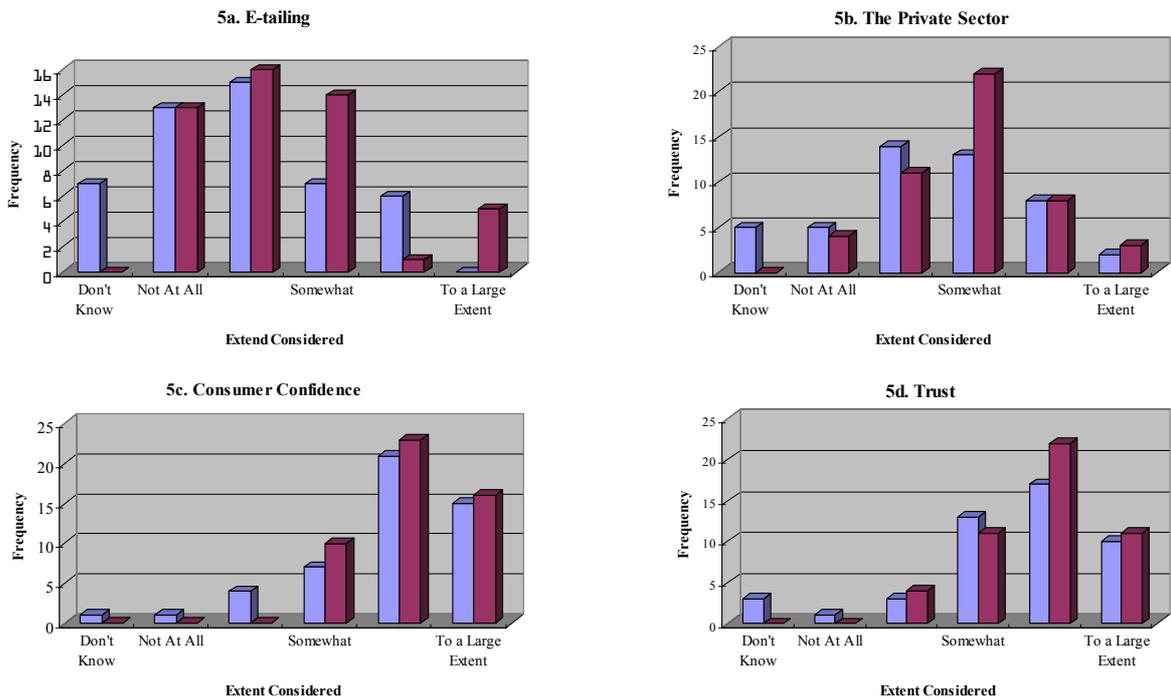


Figure 5: Relationship issues

4.3.4 Issues of regulation

The NZ government continues to introduce Legislation such as the Electronic Transactions Act. Figure 6a indicates that policymakers in 2000 believed legislation to be a significant issue when implementing e-government, which again may be a reflection of the environment in which local government staff operates. This trend continued in 2004, with approximately 68 percent of respondents having strong awareness of the Legislation issue. The subject of Taxation of the

Internet is at the forefront of international e-commerce legislation debate. Interestingly, the convenience that would be afforded by online collection of local taxes was either not recognised or was not considered by many of the local bodies in 2000, see Figure 6b. The attitude of local authorities appears to have changed somewhat with more authorities reporting that they would give some consideration to online local tax collection.

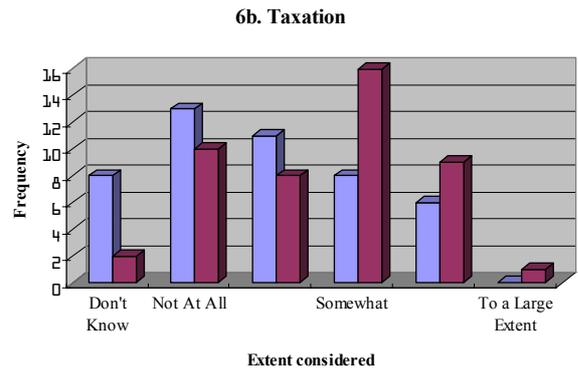
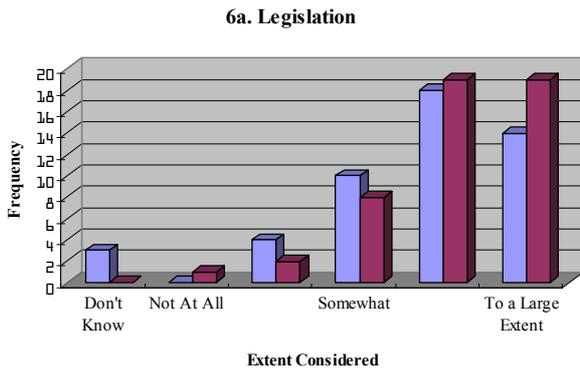


Figure 6: Regulation issues

4.3.5 Issues of protection

Issues of Security and Privacy are important because citizens can doubt the security of the information they provide over the Internet. Figures 7a and 7b both indicate that many Local Authorities were aware of these issues even before 2000, and rated them as being significant.

In the case of security, around 40 percent of respondents reported they considered it to a large extent in 2004, a far higher percentage than in 2000. In contrast, the attention given to the privacy issue appears to have not changed significantly since 2000.

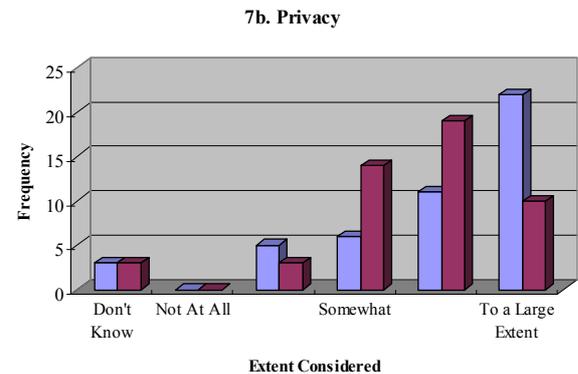
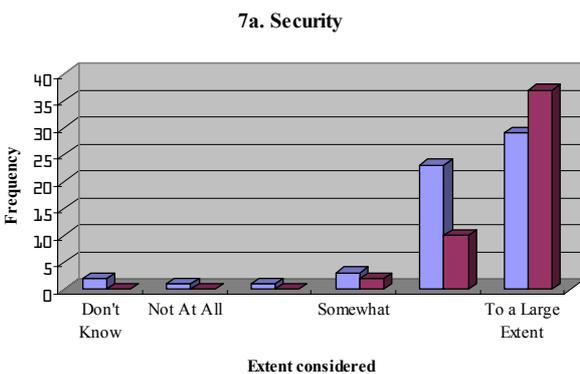


Figure 7: Protection issues

4.3.6 Societal Issues

When publishing information about different ethnic groups on a website, local government officers need to be aware of the cultural sensitivity attached to such information. This issue was not explicitly tested in the survey as it was judged to be part of the Indigenous Peoples issue. The earlier Figure 4c showed that the majority of respondents rated the needs of the ethnic group Indigenous Peoples to be only of 'Somewhat' significance. The redefinition of the workplace can create (internal) cultural obstacles that influence the success of e-government implementation. Figure 8a indicates that internal culture was considered a reasonably significant issue in 2000, a feeling heightened further in 2004. In 2000 NZ

was also experiencing a shortage of technical IT graduates and Figure 8b shows that the quality of the internal IT workforce was a significant issue for many respondents when deciding to implement a website; this situation had eased somewhat by 2004.

Finally, respondents were asked to what extent they considered Social Effects when developing their websites. Figure 8c indicates that, in 2000, 19 percent of respondents did not understand what the desirable and undesirable social effects might be, and overall did not feel strongly that this was an important issue for them to address; this situation had also improved somewhat by 2004.

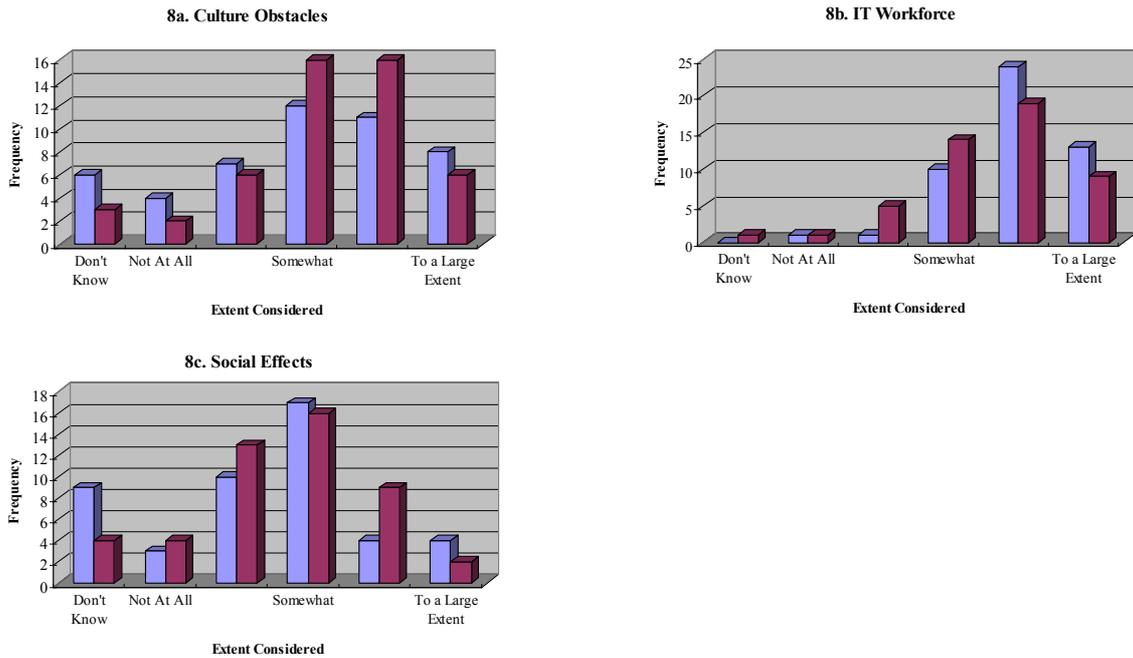


Figure 8: Societal issues

5. Discussion

This longitudinal study has tracked the evolution of e-local government in New Zealand across the years 2000-2004 and has uncovered a number of interesting developments. Currently, almost every local authority has an operational website and also spends significant amounts on maintaining the virtual presence. Sixteen out of twenty-one desirable Oultwood Local Government Web Site Index features showed increased incidence, with local tax collection being the most marked (a 66 percent increase, to 69 percent of responding organisations). The 2000 study highlighted the significance that respondents accorded to sixteen key policy issues judged by the authors to be vital to e-government success. Six of the sixteen key issues (E-procurement, Digital Divide, E-tailing, Taxation, Cultural Obstacles, Social Effects) were not well understood by local e-government policymakers in spite of strong central NZ government promotion. There was good demonstrated support for eight of the sixteen key issues (Efficiency, Accessibility, Consumer Confidence, Trust, Legislation, Security, Privacy, IT Workforce) while, in contrast, four of the sixteen key issues (E-procurement, Indigenous Peoples, E-tailing, Taxation) were not considered to be significant issues by NZ local government policymakers, and the remaining four had a mixed basis for support (Digital Divide, Private Sector, Cultural Obstacles, Social Effects). These key issues remain relevant today and the 2004 results indicate some changes in the views of policy makers, with a marked overall improvement in the understanding of the terms being used. Issues of

Security, Legislation and the potential of e-government as a taxation-gathering tool received increased recognition by policy makers in 2004. This research has shown that NZ Local Authority websites now display some consistency of good website design and authorities have realised the value of publishing information to the web, although apparently at the expense of receiving information from citizens and achieving true e-democracy. For example, while every local authority website today publishes details of Council's responsibilities and provides a search engine and downloadable documents and forms, and many display local panoramas, aerial photos and virtual tours, thus far only two-thirds of sites offer a web-visitor survey. Hence, it would appear that electronic voting is still some way off.

Overall, few Local Authorities in NZ are prepared to buck the trend of providing online services and most appear to be following the 'Follower' migration path described by De Kare-Silver (1998), Figure 9. This path involves:

- Providing a wide range of Local Authority information, with no change to traditional operations.
- Monitoring and responding to increased citizen interest in electronic government and perhaps offering some functionality via the Internet, again with no change to traditional operations.
- Experimenting with electronic government as an alternative distribution channel for information and Local Authority services.

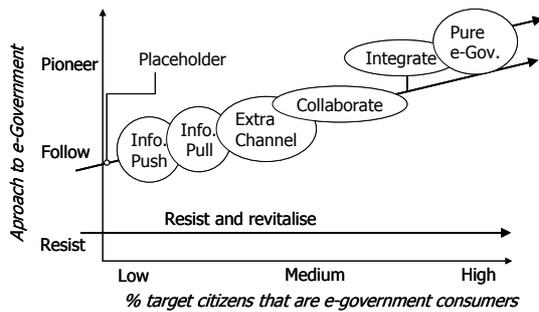


Figure 9: Evolution of e-government (modified from de kare-silver (1998))

Yet there are further opportunities for local government authorities to use e-government strategically. Depending on the size of the target audience and the attitude taken to e-government by policymakers (e-government resistor, follower, or pioneer), the website can be used to progressively):

- Experiment with electronic government as an alternative distribution channel for information and Local Authority services.
- Enable risk sharing and a more collaborative relationship with contractor and preferred

supplier firms. No change to traditional operations.

- Recognise the continued importance of a physical presence and provide integrated and complementary channels to satisfy citizens on all fronts.
- Switch fully to become a dedicated electronic government by reducing physical sites as electronic operation grows.

A study of this scope inevitably has its limitations and the major limitation of the present study is that a 100 percent response rate from policymakers was not achieved, giving incomplete snapshots of the local e-government scene in 2000 and 2004. The fact that the responding organisations are likely to be different also makes direct comparisons questionable. While this research has answered some questions, many more merit future investigation. For example, how is e-government being used for gathering taxation revenue? How is e-government impacting employees? And, how are citizens reacting to e-government?

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Fad or Investment in the Future: An Analysis of the Demand of e-Services in Danish Municipalities

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Abstract: The Internet has created a new window for citizens to interact with the public sector through the means of electronic services (e-services). Municipalities throughout the Western world are competing to offer as many e-services as possible and several studies have explored the contents and nature of e-services for citizens. Most of these studies have dealt with the possibilities and reach of e-services. The present study applies a demand perspective focusing on which e-services citizens actually use. The use of e-services during the period May 2004 to October 2004 is analyzed based on log-files from the largest Danish provider of municipal e-services. The study fuels a discussion of whether or not the offerings of municipal offering of e-services are driven by technology fads or if they are exponents of an investment in the future that aim at improving the quality of life of citizens.

Keywords: e-government, electronic citizen services, supply and demand.

1. Introduction

One of the themes discussed under the hat of e-government is the provision of electronic services to citizens through the Internet (e-services). One reason for the emphasis on e-services might be explained by the new public management surge which has influenced the public sector for the past decade (Box, 1999; Fountain, 1999). Another reason for the interest in governmental electronic interaction with citizens is the massive diffusion of the Internet in private homes at least in the Western part of the world. This diffusion leads to the assumption that the Internet has created a demand for e-services by citizens (Grant and Chau, 2005). Yet another reason for researchers' interest for study of e-service provision might be its central role in policy documents and its visibility in society (Andersen and Henriksen, 2005). Some of the first published studies on e-services focused on the functionalities of e-services. Examples of e-services provided by government to citizens and businesses were presented laying much emphasis on the variety of services, which actually could be offered through electronic channels. Proceedings from the first international conference on electronic government (Traunmüller, 2002) and research contributions such as Atherton (2002) and Bannister and Walsh (2002) demonstrate this focus.

Another perspective regarding e-service research, which deviates from the presentation of single cases of e-service provision by governments, is the more procedural view of e-services. This perspective focuses on classifying the nature of e-services. A number of articles presenting stage models of e-service provision dominates this perspective of e-service research, (see for example Grant and Chau, 2005; Layne and Lee,

2001; Moon, 2002). A common characteristic of the stage models outlined for e-government and e-services is their technical focus and consequently also an approach where the capabilities of technology determines the reach and sophistication of each stage of e-service provision. These two approaches to e-service research are generally dominated by very descriptive accounts, which is not unlike e-government research in general (Grönlund, 2004).

To change focus and start discussing issues beyond singular phenomena and technical capabilities one approach could be to focus on uptake, deployment, and implications of the public sector providing electronic services to its citizens thus opening the discussion of citizen inclusion in – or exclusion from the e-society. The objective of the present study is to pursue this direction of e-service research. The article focuses on the demand of e-services offered at the municipal level. The article provides an analysis of which types of e-services citizens in Denmark access. Based on log-files of twenty-four e-services offered by the largest Danish provider of municipal e-services the frequencies of unique users of these twenty-four e-services were extracted. The remainder of the article is as follows. The next section presents previous research in the domain of public sector e-services. The section focuses on those contributions, which have discussed if and how the public sector can learn from the private sector when offering on-line services. The objective of this discussion is to highlight the fundamentals of public service provision and to question whether these can be met by applying lessons learned in the private sector in relation to e-commerce. Thereafter follows a presentation of the procedure for the data collection of the present study. This leads to the penultimate section where data is presented. The final section

offers an analysis of data. Furthermore, the section presents some reflections on how to interpret the findings and also some suggestions for future research in the domain of public sector e-service provision.

2. e-Service research and findings

The provision of electronic services to citizens is considered to be one of the core elements of e-government (Grant and Chau, 2005). Gilbert et al. (2004) define e-service as "...the government organizations' delivery of services electronically" this definition is generally shared by other researchers studying e-government and e-services see for example Aldrich et al. (2002) and Moon (2002). Though IT in the public sector is not a new phenomenon (Danziger et al., 1982) the direct window to citizens via the Internet is relatively new (Holden et al., 2003). This has led to discussions on whether the public sector can learn from the experiences gained by the private sector with respect to e-commerce. In the private sector a lot of people got accustomed to retrieve information and perform transactions via the Internet (Al-Kibsi, 2001; Buckley, 2003). Buckley discusses the inherent complexity of e-service provision in the public sector and concludes that in order to embrace the breath and depth of electronic service provision in the public sector experience from both private sector e-commerce and e-government should be included. Al-Kibsi (2001) works along the same lines and suggests that government should team up with private businesses when establishing governmental services on-line to citizens. Fountain (1999) on the other hand concludes that it is not possible based on private sector business logic to draw any conclusions about the mechanisms supporting an understanding and diffusion of e-services in the public sector.

However, regardless of Fountains' stance about the particular logic for the public sector criteria for assessing the quality of public e-services are often based on measures developed from experiences in the private sector (Barnes and Vidgen, 2003; Buckley, 2003; Teicher et al., 2002). One reason for this focus could be explained by the new public management paradigm (Hood, 1991), which influences most Western societies. The new public management discourse is rooted in a logic based on market-like practices with respect to streamlining service provision (Box, 1999) where concepts such as efficiency and slimming of public sector institutions are central building blocks. This trend is also reflected in the citizens' expectations towards the public sector. Citizens have reached a point where they based on their experiences

with private on-line service solutions expect high quality in services, stability, efficiency, and integration across government agencies (Hazlett, 2003; Stamoulis et al., 2001). From this perspective the provision of e-services becomes a fiat rather than an option for government. Therefore, municipalities have to consider which e-services they can afford to offer and, more precisely, which services they can afford not to offer to their citizens (Kaylor et al., 2001) if they want to avoid being looked upon as old-fashioned. Common for the above-mentioned studies is the assumption that there is a demand for e-services from citizens and implicitly also that citizens will benefit from using the e-services.

Benefits of e-services more specifically related to the public sector domain include transparency of processes and visibility for users (Buckley, 2003), and the offering of services via the Internet as a new vehicle for citizen-initiated contact and interaction with government (Thomas and Streib, 2003). A number of researchers have studied the notion of e-service quality in the realm of e-services (Barnes and Vidgen, 2003; Buckley, 2003; Teicher et al., 2002). Buckley (2003) identified three common quality aspects of e-services required for public on-line services: user-focus, user satisfaction, and outcomes. Application of these parameters in the public sector may however not be straightforward. Contents and user-interface of public information provided via web sites has to be user-friendly and easily understandable for all to avoid that some groups are excluded from using the services offered. Contrary to private providers of services, who can choose which services to offer this is not the case in the public sector (Teicher et al. 2002). Government has an obligation to offer services universally e.g. health care or primary schools, or to specific eligible groups e.g. socially marginalized or elderly citizens. Therefore, service provision cannot be premised on a clients' ability to use the Internet as a means for communicating with the public sector.

Another feature which puts the notion of quality into perspective is the fact that public sector institutions operate in a monopoly rather than a market (Fountain, 1999). The public sector cannot pick its "customers", and the citizens on the other hand do not have other options if they are in need of social benefits or public care. The situation is therefore, that the public sector operates in a context where it has to provide e-services that are comprehensive and user-friendly for all groups, and in particular to those groups which really need services from the public sector.

In a study of the reasons for individuals' choice of electronic self-service delivery among UK citizens

(Gilbert, 2004) it was found that lack of trust with respect to financial security and information quality were among the barriers for a high level of adoption, whereas savings of time and money were perceived as drivers for adoption of e-services. In an on-line survey of barriers for e-service adoption in UK, Spain and Greece Vassilakis et al. (2005) found that barriers were mainly related to two types of explanatory factors: the citizens lack of knowledge regarding the existence of on-line services and the citizens inability to locate relevant sites. Thomas and Streib (2003) focused on reasons for users visiting government web-sites. Thomas and Streib found that most responders used government web sites for one-way communication. The rate of interaction with government agencies was lower. Interaction included direct request for services, placing of complaints or simply expressing of opinion. The findings of Thomas and Strieb (2003) indicate that citizens are not yet ready to full on-line interaction with government, and both parties are therefore not yet able to fully harvest the benefits of e-services.

Based on a selective literature review of e-services a conceptualization of the phenomenon has been outlined and a discussion of some of the fundamental challenges for assessing the strengths of the services has been opened. The common factor for the cited examples is that analysis has been based on self-reported input from users and potential users. The present approach to the study of the e-service uptake differs fundamentally from this approach since it focuses on actual use measured as traffic at municipal e-service sites. The next section presents how the empirical study of e-service demand in Denmark was performed.

3. Design of the study, data collection, and method of analysis

To study the demand for e-services among citizen's log-files from the largest provider of municipal e-services were obtained. The e-service provider is a private company established in 1972. Since its beginning the company has focused on developing and supporting IT-systems in the public sector in Denmark. The company has particular focus on developing IT-systems for municipalities. Today, almost all Danish municipalities subscribe to some or all of the municipal IT-systems developed by the company. The company's core business is to provide back-office IT-systems supporting the daily IT-operations in the municipalities. In 2002 the company started to develop and market e-services. The e-services offered by the company can be integrated to the back-office IT-systems

already implemented in the municipalities. The log-files included in the present analysis registered the traffic during the period May 2004 to October 2004. The data used for the analysis is based on the traffic to the entry page of each of the twenty-four e-services included in the present sample. It may be difficult to isolate citizens from other stakeholders in a public sector context (Hazlett, 2003), and the included data can not be used to identify why a given person accesses the information provided at the e-service site. It was also not possible to distinguish between the citizen's use of the e-service in her capacity as a voter, a taxpayer, a needy, or a professional. No distinction is made between the private user and the specialist user as done by (Laskowski, 2000). Instead, focus is on traffic generated on a particular e-service regardless of the purpose of the traffic.

In order to measure and qualify the level of interaction between the user and the municipality three levels of user skills were defined. The three levels of user skills reflect the degree of user commitment required and indicate the possible level of e-service interaction that can be achieved.

Table 1. Levels of user skills

Level	Skills needed by citizen for using the e-service
Low	Basic Internet surfing skills. The service provides information but there is no possibility of interaction beyond gathering information. The navigation skill required is familiar to most Internet users.
Medium	Personal information such as address or social security number (CPR) has to be provided to use the service. The citizen must have the personal information required at hand when using the service. The services in this category are typically related to for example calculation of social benefits. Interaction is content sensitive and communication is often based on specific information formats.
High	The service requires unique identification of the user, a pin-code or a digital signature. The pin-code or the digital signature must be obtained in advance in order to use the service. The citizen can complete legally binding transactions. Similar to the medium level of requirements the interaction at this level is based on specific formats.

The twenty-four e-services were classified according to level of user skill required (cf. Table 1). Two persons independently classified each service. The classification was based on use of the service via the web site. It is acknowledged

that this way of classifying the services is only an approximation to the real situation. Firstly, it must be recognized that it is a very different situation when a citizen visits the site in order to apply for a needed service or when a researcher without having anything at stake browses a site in order to examine the contents. Secondly, the two examiners belong to a user segment, which is probably well above average with respect to skills in using the Internet. Regardless of these shortcomings it was found that the classification did resemble the three types of services in a reasonable manner. To analyse the demand for the various services the ratio of the number of entries made and the total population, which had access to the service, was calculated. It should be stressed that not all services are offered to all citizens in Denmark. Some municipalities have been more eager to adopt the services than others (Henriksen, 2004). Therefore, the total population, which potentially had access to the services, varies across the 271 Danish municipalities.

4. E-services included in the sample

In Table 2 a list of the twenty-four e-services included in the sample is presented. The twenty-four e-services were the total number of e-services that the private provider offered to municipalities at the time of data collection. The order of the e-services listed in the table is based on the order of the original data where the e-services are listed alphabetically (it resembles the lists at each of the 271 municipal web-sites hosted by the provider of the e-services). There is hence no priority in complexity of use or subject matter based on trust departments such as housing or child benefits. Table 2 shows that most of the e-services offered are at the high level of user skills (cf. Table 1). It is in other words not enough that the users are capable of navigating the Internet. The users also need to obtain a pin-code or a digital signature in order to make full use of the services. The twenty-four e-services represent a mix of municipal core services such as services which help citizens to apply for social benefits, announcement of change of address, or the utility check where citizens can monitor consumption of utilities and make payments. Other services offer information. That is for example the case with the service "municipality facts", which provides key figures of the municipality, or the "budget-module" which can help people to get a better overview of their financial situation. This type of service resembles the notices at billboards, folders found in public offices, and announcements published in local newspapers.

Table 2. List of e-services, their content and their level of interaction

e-service	Contents of e-service	Level
Check of real estate data	Information on real estate with respect to changes and improvements can be checked and altered by the owner.	High
Calculation of child benefit	Calculation of possible claim for receiving special child benefit for parents under education.	Medium
Pay your municipality	Here the user can pay her municipally on-line, for example pay for childcare.	Medium
Budget-module	This service helps the user to draw up a budget to see how much money is available after having paid all fixed expenses. The service provides an overview of the user's financial situation.	Medium
Building-guide	Through this service the user can report building on the user's real estate. The guide helps the user to meet the legal requirements of a building project.	High
Maternity/paternity leave	The user can get information about the rules for getting paid leave. To check the status of the users' paid leave the user need a pin-code or digital signature.	High *
Housing benefit	The user can calculate her eligibility for housing benefit. The user can apply for housing benefit online.	High *
Your real estate	Here the user can get an overview of all the information the user's municipality stores on the users' real estate.	High
Taxation matters	Provides insights to ongoing and finalized tax matters. Letters and memos are available.	High
Real estate facts	All public information about real estate in Denmark is available through this service.	Low
Change of address	The user can change her address electronically through this service. She can print a receipt after having finalized the registration.	High
Institutional facts	Information about choices of local child care.	Low
Municipality facts	Key figures about municipalities are	Low

	exhibited on this site. Comparisons of municipalities can be made. A top-ten list is provided on each key figure.	
Utility check	Reporting of consumption of utilities such as water, electricity etc. of the user's household.	High
Signing up for waiting-list	The user can put her child on a waiting list of the institutions the user wants her child to attend.	High
Childcare guide	Direct access to put the user's child on a waiting list for childcare.	High
Central payment service	Through this service the user can notify that she wants her payments to be handled electronically and automatically.	Medium
Guide to social pensions	The user can calculate if she is eligibility for social pension through this service.	High
Placing on waiting-list	Check the user's position on a waiting list.	High
Sickness benefit	Employers can apply for sickness benefit through this service.	High
Apply for child benefit	Application for ordinary and extraordinary child benefit for one-parent families.	High
Withdrawal of child	The user can withdraw her child from an institution through this service.	High
Valuation index	The user can examine the official valuation of any real estate in Denmark through this service.	Low
Scholarship	Application for scholarship for the user's children to nursery school.	High

* It is possible to access information on the low level but to achieve full benefit of this e-service requires a pin-code or a digital signature.

In Figure 1 an estimate of the demand during the period May 2004 to October 2004 for each of the twenty-four e-services is presented.

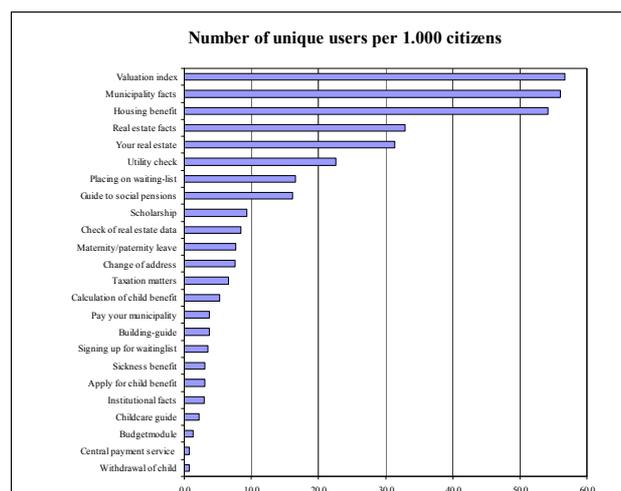


Figure 1: Ratio between number of users and potential users

Figure 1 presents in a graphical form the demands for e-services offered by the municipal portals. Generally, there is very little demand for the e-services included in the sample. Two thirds of the e-services are used by less than 1% of the potential users. And only three of the e-services are demanded by more than 5% of the potential users. Two of these three services are classified as "low", whereas the third e-service is categorized as "high" with respect to user skills. This seems to indicate that there is more demand for e-services, which are categorized as "low". To test a possible statistical dependence between demand and level of requirements the data was tested using a non-parametric test, the Wilcoxon test. Since the number of services classified as "low" and "medium" turned out to be very low, and since it was important to find out whether e-services requiring pin-codes or digital signature were a barrier for the users the categories "low" and "medium" were collapsed in this statistical test.

Table 3. Wilcoxon two-sample test

Wilcoxon's Exact Test	
One-Sided Pr >= S	0.2838
Two-Sided Pr >= S - Mean	0.5667

Table 3 shows that the test is not statistically significant. Therefore, the demand of an e-service is statistically independent of the level of user skills. There is in other words no support for the claim that users prefer one-way interaction (levels low and medium in the classification scheme). This contradicts the findings of Grant and Chau (2005) where one-way interaction dominated the e-service usage.

5. Reflections, discussion, and directions for future research

The analysis of citizens' demand for e-services has provided fuel for thoughts with respect to the expediency of priorities in the municipalities. Much effort and many resources are spent on giving access to citizen services on-line, and Denmark is as a result of this also ranked in the top-five in a number of the international e-government indexes (Economist 2005; Cap Gemini 2005; Eurostat 2005) which among other issues focus on e-service provision. Some shortcomings of these rankings are that they focus on supply rather than on demand and on external exposure rather than on improvement of internal efficiency and return on investments. From the supplier perspective (the municipalities) the deployment of the services gives rise to speculations about whether the offering of e-services is driven by a managerial fad (Abrahamson, 1996) or is it an investment in the future?

The launch of the e-services included in the present analysis started in 2002 and it is therefore a relatively new phenomenon. An interpretation driven by the theory of diffusion of innovations suggests that the diffusion process is in a take-off stage and that it is only a matter of time before a massive diffusion will happen (Rogers, 2003). Rogers claims that innovators initiate the kick off of the S-shaped diffusion curve. He states that innovators represent 2.5% of the population of potential adopters. Innovators are characterized by being venturesome with an interest in new ideas. An example of innovative behaviour is the acquisition of a digital signature or a pin-code needed for accessing most of the services included in the sample. The analysis indicated that use of e-services was independent of whether or not a digital signature or a pin-code were needed. The good news is therefore that Danish users in the capacity of innovators as role models do not perceive a high degree of skills of using the e-services as an obstacle. This could indicate an important shift in users' attitude to the Internet as a means for communication with the public sector even when sensitive information has to be submitted. Security, which Gilbert et al. (2004) found to be one of the major barriers for the diffusion of e-service usage in UK, does not seem to be a strong barrier in Denmark, at least not for those that have come into the habit of servicing themselves through the Internet. By applying Rogers' widely used model for diffusion of innovations (2003) the study suggests that the supply of e-services could be an investment in the future. The findings from Vassilakis et al. (2005) support this type of interpretation. Vassilakis et al. found that the two most prevalent barriers for e-

service uptake among citizens were related to lack of knowledge about the existence of on-line services and inability to locate relevant sites. Communication and learning are the cornerstones in the theory of diffusion of innovations (Attewell, 1992; Rogers, 2003) and it should therefore only be a matter of time before the level of demand increases given that change agencies and change agents invest an effort in communicating the e-services. It is also worth mentioning here that 80% and 84% of all Danish families had access to the Internet from their homes in year 2004 and year 2005 respectively (Statistics Denmark). One challenge is as stated by (Dugdale et al., 2005) that

"... citizens who are the biggest users of government services are the least likely to be connected to the internet."

That is typically low-income families including elderly. Denmark is still in a good position for successful diffusion even when taking this barrier into consideration. As shown in Table 4 there has been a substantial growth in the share of households with access to the Internet in the lowest income group (70% to 84%).

Table 4: Access to the Internet based on household income (2004-2005)

Income DKK	Internet access in %	
	2004	2005
0-99.999	70	84
100.000-399.999	71	74
+ 400.000	92	95

Source: Statistics Denmark (www.dst.dk)

Fountain (1999) argues that there is an in-built danger of increased inequality in the diffusion of e-government and the servicing of people on-line. Fountains' argument for this inequality is that citizens who function well and who have more resources than the average are better at raising their voices, and that they therefore are getting more attention from the civil servants. However, the most well represented issue in the e-service sample is related to parenthood and children. Nine of the twenty-four services are related to one or another aspect of parenthood or children. Applications for extra social benefits and maternity/ paternity leave are among the services directly related to parenthood. Aspects of childcare are also well represented such as signing up for kindergarten and checking the number on a waiting list for a particular institution. *Ceteris paribus*, all groups in society get children, but especially citizens with fewer resources are those that can apply for extra social benefits to make their financial situation better. This overall evaluation of the e-services in the present sample only appears partly to support the speculations

about increased inequality as argued by Fountain (1999).

The analysis shows that there is a very modest level of demand for the twenty-four e-services included in this analysis. This might however be a truth with modifications. The e-services, which are most popular, are at the 5% level. However, there are serious problems with this simplistic calculation of the demand for services. The ratios are calculated based on the total number of citizens who have access to the service. Calculation is hence based on the number of people living in the municipalities subscribing to the service. As stated above some municipalities have been more eager to adopt the services than others (Henriksen, 2004). The analysis does not take into account that some services are only relevant for certain groups of people. But, fortunately not all people in the population are potential users of a given service. An illustrative example of this dilemma of measurement is the e-service "Maternity/paternity leave". Maternity/paternity leave is estimated to be used by less than 1% of the potential users. About 48% of the population has according to the data access to this service. This equals approximately 2.5 million Danes – but, not all these 2.5 million Danes are eligible of maternity or paternity leave. In year 2003 the total number of childbirths was 64,682 (Statistics-Denmark). The data shows that 19,614 unique users accessed this service during the six-month period included in the analysis. From this perspective the "real" level of use is very high. This example clearly demonstrates the challenges of measuring demand of e-services. It is definitely a challenge for future research to focus on developing more meaningful and proper measurements for demand of e-services.

From the perspective of the municipalities the figures can be viewed as good news as well as

bad news. From a positive perspective the offering of digital services can be seen as a means for optimizing work-routines (Andersen, 2004) and generate savings hence supporting the ideas of new public management. However, by looking at the rather low adoption rates it can be argued that the provision of an alternative channel for communication with the public sector is not at present a success with respect to cost reductions given that the traditional channels of communication, phone or personal appearance at the town-hall, are still used by the great majority. Then again the measures of success are challenged: when has a citizen gathered enough information? In the present study focus was on the number of unique entries to a given service. We did not analyze how many entries led to a completed and submitted application. To some people the interaction ends by getting information about the likelihood of getting a specific benefit. Information is in many cases enough to decide whether further interaction will lead to a desired result. Viewed from this perspective the provision of e-services resembles the function of a search engine, which can filter out more simple cases thus leaving resources for the more complex cases. The study of the demand for e-services has revealed serious challenges concerning methods on how to study and analyze this area. Fortunately, not all citizens need to apply for services or social benefits. Therefore, it is difficult to determine the size of the group of potential adopters. Some effort should be made to determine the size of the population under investigation in relation to each e-service. Future research should also include estimates of the actual number of completed and submitted applications for a given service in order to determine whether or not e-service diffusion in Denmark is a success or a failure.

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Integrating the IT Infrastructures in Healthcare Organisations: a Proposition of Influential Factors

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Abstract: The healthcare industry is composed of primary and secondary healthcare providers. Each provider needs to exchange information with other providers. Information Systems (IS) developed on different types of hardware and software platforms serve this need. Due to the heterogeneous and distributed nature of information and communicating technology (ICT) in the healthcare industry, sharing of the data has become an issue. There is an urgent need for the integration of these distributed IS. Several efforts have been made to achieve the integration, but traditional methods can only in part address integration problems. Enterprise Application Integration (EAI) offers another solution to addressing the needs of healthcare information systems integration. From a technical perspective, EAI overcomes integration problems at all levels (e.g. data, process etc.) by providing a flexible and manageable Information Technology (IT) infrastructure. From a business perspective, EAI reduces the overall integration costs by minimising integration time and maintenance cost. A literature review in the area of EAI indicates that EAI adoption has not been studied in depth in relation to healthcare organisations. However, there is a clear need for healthcare organisations to seek EAI adoption. In doing so, a conceptual framework for EAI adoption in healthcare organisations is proposed. Decision makers in healthcare organisations, can use this model when considering EAI adoption.

Keywords: Healthcare organisations, adoption, and Enterprise Application Integration.

1. Introduction

Within organisations, information technology implementation decisions are often made at the departmental level, with each department choosing technologies and solutions based on its own needs and beliefs (Erasala et al., 2002). These applications are often not developed in a coordinated way but have evolved as a result of the latest technological innovation (Themistocleous et al., 2000). In most of the cases the programs are written in different computer languages, compiled on different platforms, run on different hardware and have different data structures, types and formats. They function independently and do not share their data. As a result, the IT infrastructure in such organisations consists of a number of autonomous and heterogeneous solutions, which cause integration problems.

Following recent trends the healthcare sector has turned to the use of information technology to automate and improve business processes. As a result, in healthcare organisations there are numerous information systems, ranging from personal management to department-specific decision support systems (Hakkinen et al., 2003). These information systems function independently and their interconnectivity and interoperability have continued to be a big issue, as in any healthcare organisation it is essential to be able to retrieve information from disparate information systems.

In healthcare organisations integration of disparate information systems has therefore been viewed as high priority. Over the last two decades continuous efforts have been made to solve integration problems. EAI has now emerged as another approach to solving these problems. EAI software provides the infrastructure to connect rapidly and interface information between organisations internal and external applications. The advantages of this approach are that enterprises develop a flexible and efficient IT infrastructure by integrating functionality from existing and new applications.

This paper investigates the adoption of EAI in healthcare organisations. Initially the problems of integration of healthcare information systems are explored. Thereafter, the role of EAI in healthcare organisations is examined. Furthermore, the authors investigate the factors that are related to EAI adoption in healthcare organisations. These factors are combined to develop a conceptual framework that focuses on EAI adoption in healthcare organisations.

2. Adoption of information technology in healthcare organisations

The adoption of digital computers, fast communication channels, and the Internet has all dramatically changed the management of information in organisations. However, the healthcare industry is one of the few sectors where the adoption rate of IT is very slow

compared to other industries (Clark, 1995) due to inadequate IT budgets (Grimson et al., 2000). The healthcare industry expenditure on IT was about 2% of its total budget as compared to 10% in other industries (Clark, 1995). For this reason, the early use of IT in healthcare focused on computerisation of administrative and financial functions and in such areas as patient's appointments and admissions (Egan and Liu, 1994). Only more recently have healthcare organisations turned to the use of IT for clinical purposes and to the improvement of patient care (Ferrara, 1998). Several developments in IT implementation have taken place in healthcare organisations, with IT playing an increasingly significant role in its delivery. All these technological developments have been made in providing effectively functioning systems to healthcare organisations to improve healthcare services (Grimson, 2001). Computerised Patient Record (CPR) systems, adoption of Internet along with Intranets and Extranet, use of Asynchronous Transfer Mode (ATM) networks along with local area networks, wide area networks, enterprise systems, integration approaches and remote diagnostics via telemedicine have all experienced significant growth in recent years (Raghupathi and Joseph, 2002). As a result, IT is now being extensively used at the primary and secondary levels of healthcare units. This has resulted in healthcare information systems being increasingly developed at primary and secondary healthcare levels. This situation has in turn resulted in a large number of heterogeneous and mutually incompatible systems emerging at these levels (Ferrara, 1998).

These modernisation efforts in the healthcare sector have also resulted in the development of several new types of application at the primary and secondary care levels. At the primary care level in the United Kingdom (UK) it has been observed that the basic foundation of healthcare providers comprises the General Practitioners (GPs) and primary healthcare centres, which provide basic healthcare services to the community. Initially, the demographic and clinical records of citizens are kept with the GPs, most of whom use IT applications such as Egton Medical Information Systems (EMIS) and Patient Information Systems (PIS) in their practices. The current use of IT at GP level has grown significantly. 96% of GPs are now using IT applications for the clinical purposes (Pemberton et al., 2003). Unsurprisingly, the sharing of patients' records among GPs and hospitals is a big issue. Nonetheless, the IT is being used extensively at secondary healthcare level such as general hospitals, results from healthcare information systems being increasingly developed

at general hospital levels for wider applications. The use of IT applications at the secondary care level is thus rapidly evolving beyond what in the past has been considered a clinical information system. Healthcare IT now encompasses new tools and healthcare services that are delivered or enhanced through the Internet and other advanced networking technologies such as speech recognition tools. These applications have been developed to support particular functions in healthcare organisations. This too has resulted in a large number of heterogeneous and mutually incompatible systems (Grimson et al., 2000). Overall, therefore, the integration of these applications within hospitals, GPs and government bodies, is one of the most urgent priorities to meet the increasing clinical, organisational and administrative needs (Ferrara, 1998).

As noted above, several approaches have been used to address the problem of systems and data integration. Electronic Data Interchange (EDI), Health Level 7, CEN/TC251, Synergy Extranet (SynEx), Synapses, etc) have been developed and/or deployed in this effort. These integration approaches have themselves caused significant problems, such as high operational cost and functional difficulties. Moreover, most of these approaches are based on message-based technologies such as Message-Oriented Middleware (MOM). According to Edwards and Newing (2000), MOM has a number of disadvantages including (a) it creates single point-to-point links between different applications (b) it requires altering the source and target applications and (c) it increases maintenance costs and complexity. Communication software of this type is not able to achieve the integration of such systems and cannot provide interoperability, whilst meeting the requirements of healthcare organisations as a whole.

3. Integration of healthcare systems with EAI

Enterprise application integration has been introduced as a solution to intra and inter-organisational systems and process integration. It results in more organised business process, increases collaboration among partners and achieves process integration (Themistocleous, 2002). EAI provides a solution to intra- and inter-organisational systems and it combines traditional integration technologies (e.g. database-oriented middleware, interface-based technologies, distributed object techniques, etc) with new application integration technologies (e.g. adapters and message brokers) to support the efficient communication with customers and business

partners. Thus, EAI can efficiently incorporate custom applications, packaged systems and e-business solutions into a flexible and manageable infrastructure Themistocleous et al., (2002). Because of this, EAI is being widely adopted by various organisations to solve integration problems. The benefits of EAI are important, as they reduce the cost of integration and the redundancy of data. Evidence from case studies published in the area of EAI suggests a 50% cost reduction in integration costs (Themistocleous, (2002). Moreover, EAI strengthens supply chains and improves the relationships between organisations and suppliers. Other benefits that EAI delivers include efficient data sharing, reliable data transfer, better security system and good return on investment. EAI can also be used to create an integrated infrastructure in healthcare organisations.

Raghupathi and Josph (2002) report two key dimensions of systems integration in healthcare industry: internal integration of the systems and external integration. Internal level mean at, for example, hospital level and at external means at with other hospitals or healthcare units, general practitioners (GPs) and other stakeholders. All of these can be integrated using EAI technology. Needs to say, this type of integration can provide significant benefits to hospitals and the patients'. Internal hospitals integrated infrastructure provides the facility to share data among different applications connected with each other. Functioning of these applications eliminate the duplication of data entry at different department levels.

4. Theory development for influential factors

Technology adoption has been an important issue for IS research and practice. Many previous studies, the theory of innovation adoption (Rogers, 1983) and integration technologies adoption studies (e.g. Iacovou et al., 1995; Somers, 2000; Themistocleous, 2004; Chen, 2003) indicate that different factors influence the adoption of IT-based innovations in an organisational context. These studies investigate the factors that influence the adoption of IT innovations in organisations. Some of this research posits a simple type of causality and suggests that standard research methods such as case studies and surveys can be employed and relationships between the factors can be tested through various methods. The resulting model of adoption does not require complex interpretations by academics and practitioners and it can be easily translated into a set of guidelines (Kurnia and Johnston, 2000). However in a review of IT

adoption studies, Fichman (1992) argues that IT adoption factors by themselves are unlikely to be strong predictors for the adoption of complex organisational technology, suggesting that additional factors should be added. Many researchers suggest that, any borrowed model needs to be refined and tailored to match the context of application (Kurnia and Johnston, 2000). Thus, innovation adoption must be studied within appropriate contexts and with factors tailored to the specifics of the innovation. Studies such as Iacovou et al., (1995), Somers, (2000), Themistocleous, (2004) and Chen, (2003), have identified several factors that influence the adoption of integration technologies in different organisations. This research uses this factor approach (Kurnia and Johnston, 2000) for the adoption of EAI in healthcare organisations.

The enterprise application integration adoption process begins with a perceived problem, through research and development to a possible solution. In the area of EAI, Themistocleous (2004) develop a framework for the adoption of EAI in the context of multinational organisations. The authors will be using the Themistocleous (2004) framework as the basis for this research for the following reasons:

- The EAI, being a new emerging technology, has not been widely studied, thus the framework proposed by Themistocleous (2004) is the only available source of reference in this area;
- Themistocleous (2004) undertook an extensive analysis of other integration technologies (e.g. EDI technology) literature and came up with an important set of factors such as benefits, barriers, external pressures and costs;
- These factors have been empirically tested through various case studies in private organisations as well as in public sector;
- These factors help the authors to analyse the adoption of EAI in healthcare organisation;
- The slow adoption of information systems innovations within healthcare organisations, and absence of specific research efforts aimed at understanding IS adoption in this industry;
- The literature review in the area of healthcare indicates limited research on organisational and human aspect of IS adoption. A few researchers such as Kimberly and Evanisko (1981) and Kim and Michelman (1990), have identified factors such as barriers, customer/patient satisfaction, organisational size and administrator and physician relationship, while studying IS adoption in the healthcare area;

- Some of the factors such as barriers and customer satisfaction are also reported by Themistocleous (2004) for EAI adoption in multinational organisations.

In addition to this, the authors have also attempted to study other integration technologies adoption models such as EDI and web services. In doing so, the common factors from these technologies are identified. The description of these factors and the development of a conceptual model for the adoption of EAI in healthcare organisations are discussed in detail in the following sections.

5. Factors related to the adoption of EAI in healthcare organisations

Table 1: Common factors identified from the integration technologies adoption models

Factors	References
Benefits	Iacovou et al., (1995), Heck and Ribbers (1999), Chwelos et al., (2001), Kuan and Chau (2001), Themistocleous (2004), Bradford and Florin (2003), Chen (2003), Wu (2004)
IT Infrastructure	Iacovou et al., (1995), Heck and Ribbers (1999), Chwelos et al., (2001), Kuan and Chau (2001), Waarts et al., (2002), Themistocleous (2004), Bradford and Florin (2003), Chen (2003), Wu (2004)
External Pressures	Iacovou et al., (1995), Heck and Ribbers (1999), Chwelos et al., (2001), Kuan and Chau (2001), Waarts et al., (2002), Themistocleous (2004), Bradford and Florin (2003), Chen (2003), Wu (2004)
Costs	Iacovou et al., (1995), Chwelos et al., (2001), Kuan and Chau (2001), Waarts et al., (2002), Themistocleous (2004), Chen (2003), Wu (2004)
IT Sophistication	Iacovou et al., (1995), Chwelos et al., (2001), Themistocleous (2002), Wu (2004)
Internal Pressures	Kuan and Chau (2001), Themistocleous (2004), Chen (2003)

Various models have been proposed in literature to provide an understanding of the principles behind the adoption of technologies. Based on a comprehensive examination of literature on the adoption of integration technologies, the authors

have reviewed a variety of adoption models developed for the adoption of different integration technologies like EDI, ERP, EAI and web services. In doing so, the authors have attempted to identify the common factors in these models that can support the adoption of integration technologies in healthcare organisations. The following six common factors have been identified (Table 1). These six common factors play a crucial role in the adoption of integration technologies in different types of organisation. Moreover, in the context of the EAI adoption, the identification of these factors indicates that these factors are almost the same as reported by Themistocleous (2004) for the adoption of EAI in multinational organisations. In addition to these factors, the authors have attempted to identify the other factors, through a comprehensive review of the normative literature in the areas of EAI, web services and healthcare informatics.

Some researchers, including, Kim and Fichman (1990) have identified several factors for the development of hospital information systems to achieve the competitive advantages. These include (a) administrators' and physicians' relationship (b) political barriers and (c) customers/patients satisfaction. In addition to that, Kimberly and Evanisko (1981), in their study of identifying the factors for technological and administrative innovations in hospitals, empirically tested several factors and came up with organisation size as most important factors for the adoption of technological and administrative innovations. These, and other factors that influence the adoption of EAI in healthcare organisations, are listed in Table 2.

Table 2: Factors identified from EAI and health informatics literature

Factors	References
Barriers	Themistocleous (2004)
EAI Evaluation Frameworks	Themistocleous (2004)
Support	Themistocleous (2004)
Patient's Satisfaction	Kim and Fichman (1990)
Organisation Size	Kimberly and Evanisko (1981)
Physician and Patient Relationship	Pascoe (1983) Kim and Fichman (1990)
Telemedicine	Tyler (2001)
Compatibility	Chen (2003) Wu (2004)

Themistocleous (2004) identified several other factors that influence the adoption of EAI in multinational organisations including IT support, IT sophistication and the evaluation framework. Web services have also emerged as an approach to tackling integration problems. Web services are

used as a part of EAI. Web services adoption studies have reported compatibility as an important factor for the adoption of web services. Therefore, the authors have considered also this as factor for the adoption of EAI technology in healthcare organisations. The description of all these factors for the development of the conceptual model for the adoption of EAI in healthcare organisations is discussed in the next section.

6. Conceptual model for EAI adoption in healthcare organisations

The analysis of the factors identified results in a conceptual model for EAI adoption in healthcare organisations shown in figure 1.

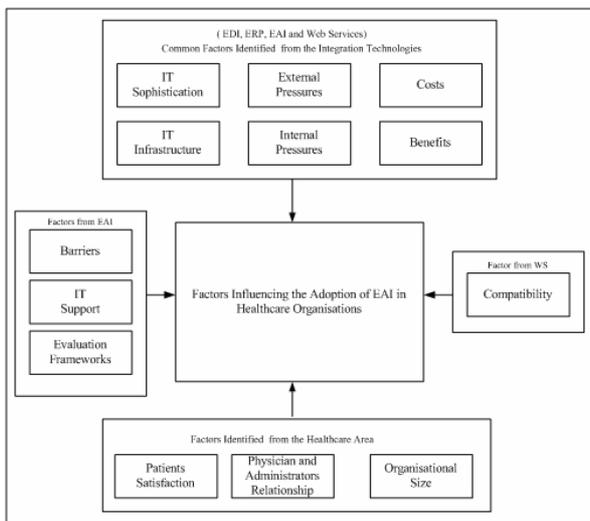


Figure 1: Conceptual model for EAI adoption in healthcare organisations

Each of these factors is now discussed.

Benefits: The identification of the common factors in Section 4 indicates the benefits that integration technologies provide to the organisation's influences as one of the factors for their adoption. In the context of EAI adoption study, Themistocleous (2004) categorised the benefits from adoption of EAI in multinational organisations as operational, technical, strategic managerial and organisational. However, these benefits cannot be applied in the context of other organisations. In the context of healthcare organisations there is a need for the identification and better understanding of these benefits. In doing so, the authors expects that this will provide better understanding to the decision makers of healthcare organisations the scope of these benefits in that particular context. Thus, the authors consider the benefits as an important factor for the adoption of EAI in healthcare organisations.

Barriers: This factor is not widely reported in the integration technology adoption model. Authors like Chowelos et al., (2001) and Themistocleous (2004) have adopted barriers as a factor in the adoption of EDI and EAI technologies, respectively in their models. Themistocleous (2004) suggests that EAI clearly presents barriers to organisations needing to consider before proceeding to EAI adoption. As stated earlier, this factor has not been reported widely, however, its importance and significance cannot be ignored for various reasons. As reported by Davenport (1998) the adoption of integration technology like ERP has caused many problems to organisations, such as bankruptcy, because they did not consider the impact of these technologies in the organisations before adopting them. In the context of healthcare organisations, Kim and Fichman (1990) have also reported barriers as a factor for the integration of healthcare information systems. According to Themistocleous (2004) EAI clearly presents barriers, with organisations needing to consider them before proceeding to EAI adoption. Thus, it is important for healthcare organisations to understand these barriers before deciding for the adoption of EAI technology. This can help them to avoid the risks that are associated with its adoption. Therefore, the authors also consider this as an important factor for the adoption of EAI technology in healthcare organisations.

Organisation size: In the organisational literature several characteristics are being used to reflect the size of the organisation (Kwon and Zmud, 1987; Wu, 2004; Chen, 2003). These include the volume of services directly provided by the organisation, business intensity and number of employees. Amongst these, the most important measure refers to the number of employees (Kimberly, 1976). However, in the context of hospitals, several other measures are also used to represent the size, such as the number of beds, total assets and number of personnel. The dominant measure used in hospitals research is the number of beds as the operational definition of size that influences the adoption of technological innovations for providing better healthcare services (Kimberly and Evanisko, 1981). In addition, Chen (2003) reports organisational size as an important factor in the context of web services adoption.

Physicians' and administrators' relationship: The integration of information systems changes the balance of power among units within the organisations (Kim and Fichman, 1990). In the healthcare industry, the relationship between administrators and physicians is particularly important because of the autonomous role of physicians. In addressing this issue, Malvey

(1981) reported that the development of integrated healthcare information systems is a problem, particularly due to the conflicts between the clinicians and administrators. In many situations, these conflicts have negative effects on the relationships between physicians and administrators resulting in a political barrier (Kim and Fichman, 1990).

Costs: Many organisations conduct a Cost Benefit Analysis (CBA) before taking any important decision regarding the adoption of new technologies. Authors Iacovou *et al.*, (1995), Martinez and Redondo (2001), Themistocleous (2004), Bradford and Florin (2003) have identified costs as a factor for the adoption of technologies, which facilitates the organisation to evaluate these costs prior to adoption. In doing so, Themistocleous (2004) did an evaluation of EAI adoption costs, and classified them based on the costs classification proposed by Irani and Love (2001). This classification identifies the EAI cost taxonomies as direct and indirect (e.g. human and organisational) information providing support to the decision maker to evaluate the costs of EAI adoption.

Patient satisfaction: Patient satisfaction stands to play an increasingly important role in the growing push toward accountability among healthcare providers. Physicians and hospitals experience growing pressure to increase the quality of their outcomes and enhance the safety of their patients (Pascoe, 1983). As a result, patient satisfaction assessment has become an integral part of health care organisations' strategic processes. Patient satisfaction has a significant impact on the performance of the healthcare organisation. Furthermore, this impact is being integrated into an overall measure of hospital performance. The adoption of information technology in healthcare organisations is being viewed as a tool to help bring improvements in the quality of healthcare services and achieve patient satisfaction (Zabada *et al.*, 2001). The non-integrated IT infrastructure in healthcare organisations has caused the problem in providing high quality medical care and achieving higher patient satisfaction (Kim and Michelman, 1990). Kim and Fichman (1990) report customer/patient's satisfaction as a factor for the strategic use of IT in healthcare organisations and for the integration of healthcare information systems. Moreover, Themistocleous (2004) has also reports the importance of customer satisfaction which the adoption of EAI in the organisations.

IT infrastructure: The non-integrated nature of IT infrastructure causes numerous problems to organisations, which need to unify their

information systems and fully automate their business processes (Themistocleous and Irani, 2002). This influences the decision regarding EAI adoption in healthcare organisations, to provide better healthcare services, improve decision-making process, etc.. Grimson *et al.*, (2000) also reported the existing IT infrastructure in healthcare organisations as a key obstacle in providing better healthcare services. The existing IT infrastructure is therefore a factor that affects the introduction of EAI in healthcare organisations.

IT sophistication: Information technology sophistication is reported as a factor in integration technologies adoption models. The finding of two studies on the adoption of EDI Iacovou *et al.*, (1995) and Chwelos *et al.*, (2001) report that the organisations with sophisticated IT resources will be likely to be adopters of EDI technology. Iacovou *et al.*, (1995) do not report this as an independent factor, but consider it as a dimension of the organisational readiness factor in their model of EDI adoption. In the context of EAI adoption, Themistocleous (2004) has reports IT sophistication as a factor in his model. This is due to the level of understanding in addressing technical problems at an enterprise and cross-enterprise level. Wu (2004) reports IT sophistication as a factor, and represents this as technological skills readiness. According to Wu (2004), technological skills readiness is concerned with the level of required knowledge of IT personnel for the adoption of web services. As a result, organisations with higher technological skills tend to show a greater intention to adopt web services.

EAI evaluation frameworks: There is confusion in the market regarding the adoption of EAI technologies and packages, due to the diversity of EAI products and technologies. In addressing this issue, Themistocleous (2004) developed two different types of frameworks: one for the integration technologies and the other integration packages. These frameworks highlight a combination of integration technologies that can be used to integrate an IT infrastructure. In addition, these frameworks provide the support for the evaluation of EAI packages and technologies and provide the support to the organisation in its decision-making process to overcome the confusion regarding the selection of particular EAI technologies and packages. Themistocleous (2004) has reports this factor for the adoption of EAI technology. Therefore, it is important to study the validity of these frameworks in the context of healthcare organisation to see how they evaluate the EAI technology.

Support: This factor is related to vendor support, consultant support and management support. The adoption of EAI requires organisations to invest considerable amounts of money on their IT infrastructure, such as for hardware and software implementation and maintenance. Themistocleous (2004) has reports support as factor for the adoption of new technologies (e.g. EAI). This is for several reasons, such as organisations having limited knowledge of EAI adoption or lack of employees with EAI skill. Healthcare organisations are lacking the technical expertise and skill regarding EAI technology. Therefore, they need support like that from vendors and consultants while taking the decision of EAI adoption.

Compatibility: Compatibility has long been considered as a factor during the technology adoption process. Rogers (1983) defines compatibility as the degree to which an innovation is perceived as consistent with the existing values, past experience and needs of potential adopters. Using the same concepts in the web services' adoption model, Chen (2003) considered compatibility as a factor and argued that web services can be implemented as a way of wrapping older technologies to provide interoperability of new technologies with legacy systems. Wu (2004) has also considered the compatibility as a one of the factors for the adoption of web services.

Telemedicine: Traditionally, telemedicine systems have been designed to improve the care process by allowing physicians to consult a specialist about a case without sending the patient to another location, which may be difficult or time-consuming to reach. However, the existing infrastructure of telemedicine is based on dedicated private networks. These networks are relatively expensive to develop and maintain. Developments in technology such as the wide availability of Internet connectivity and client and server software, and video conferencing have made low-cost telemedicine applications more feasible. However, the non-integrated nature of the infrastructure of many healthcare organisations does not allow much potential usage and the consequent advantages attached to telemedicine.

Internal pressures: This factor represents several pressures such as technical and managerial. Healthcare organisations have various drivers such as provision of better healthcare services, medical errors, data security and privacy, that motivate the adoption of new technologies. These pressures initiate the adoption of EAI in healthcare organisation.

External pressures: The adoption of integration technologies in various organisations indicates that the organisations were subject to several external pressures from agents such as competitors, suppliers and customers for the adoption of integration technologies. In the context of healthcare organisations, there are several stakeholders, such as patients, suppliers, insurance service providers and government bodies collaborating with the organisation. They always expect collaboration with their organisation to be better. Patients continually demand better services and care such as appointments, correct record keeping, and availability of information wherever required. These external pressures influence the healthcare organisation to bring improvements to their working.

7. Conclusions and future research

This paper began with the discussion of IT adoption in healthcare organisations that identifies the different IT approaches adopted in healthcare organisations. These include computerised patient record systems, adoption of Internet along with intranets and extranet, ATM networks, enterprise systems, integration approaches and remote diagnostics technique via telemedicine. The widespread adoption of IT applications at different level in healthcare organisations, with different type of hardware systems raises the need for adoption of integration approaches for the sharing of data between these applications. As a result, various integration approaches have been adopted to solve problems. These approaches can only in part address integration problems. These problems motivate the adoption of EAI in healthcare organisation. EAI has emerged to provide significant benefits to the organisations to overcome integration problem and reduce the overall integration cost due to reduction of integration time and maintenance cost.

This paper identifies a gap in the literature namely the absence of a theoretical model for EAI adoption in healthcare organisations, which ascertains and identifies benefits, barriers and costs associated with EAI adoption in healthcare organisations. Various models have been proposed in the literature to provide an understanding of the principles behind the adoption of IT innovations. Most of these studies are based on the factor approach, in which several factor are identified that influence the adoption of various integration technologies. In addition, in the area of EAI, Themistocleous (2004) developed a framework for the adoption of EAI in the context of multinational organisations. Themistocleous (2004) analysed several factors

and tested them through different case studies that support the adoption of EAI.

Using the concepts of these factors this paper further expands the scope of this research by exploring the areas of EAI, web services and health informatics. In doing so, several other factors were identified including barriers, organisation size, physician and patient relationship and patient satisfaction, telemedicine,

IT support, EAI evaluation framework and compatibility. These factors can support the development of EAI adoption model for healthcare organisations. Future research in this area is now needed to test the framework empirically. In the meantime, the proposed framework can be used as a decision-making tool and support management when taking decision regarding the adoption of EAI in healthcare organisations.

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Enhancing Public Sector Service Efficiency by Electronic Commerce

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Abstract: In December 2000, the city of Turku, Finland, outsourced its open care grocery shopping to an online grocery retailer. The city officials expected that an outside e-commerce player would among other things bring time savings so that the open care service would be able to focus on caring for the elderly and the disabled at home. This paper examines the expected and realised effect of electronic commerce on the efficiency of the grocery shopping service from the viewpoint of the three main stakeholders: the customers, the employees and the management. The findings are based on employee and customer surveys as well as interviews with the open care management. The research combines both quantitative and qualitative methods.

Keywords: Open care, efficiency, electronic grocery shopping, e-government

1. Introduction

In Finland the public sector has the principal responsibility for providing for welfare services. In this way the Finnish state seeks to guarantee a sufficient and equal level of services for all citizens (Oksanen, 2002). The Finnish law was changed in 1993 to allow for the public sector social services to buy almost limitless services from outside (Valkama et al., 2002; Sasi and Aho, 2001). Compared with countries like Great Britain, the outsourcing of public sector services has been moderate, and as a rule only parts of service production have been outsourced and the municipal authorities have still been involved in, or at least retained a certain degree of control over, the actual production processes. As in most other western countries, the number of old people in Finland is constantly increasing, whereas at the same time less money is spent on municipal care (Hellstrom and Hallberg, 2001). The national social policy is to favour and develop municipal service forms which let the old people stay at home as long as possible. However, at the same time as the total number of open care customers has increased significantly, the number of open care personnel has stayed practically the same. Due to a general lack of resources, there is no hope of bringing the staff numbers up to better meet the increased demands. In Turku, a city of 160.000 inhabitants in southwestern Finland, the situation is no different.

This paper discusses the expected and realised value for social services from outsourcing the grocery shopping service to an online grocery retailer. The discussion is based on employee and customer surveys and interviews with the city open care management. We have also used

minutes from social services' meetings over four years and local media coverage as background material. In addition to these materials, outsourcing theory and literature on outsourcing in the public sector are reviewed.

2. Online grocery shopping: predictions and reality

In the late 1990s, estimates on the future potential of online grocery shopping ranged from the bold numbers projected by Wydra and Martin (1997), putting online shopping at up to 20 % of total grocery shopping by 2003, to Forrester Research's more cautious prediction of 2 % by that time (Corral, 1999). Today we can see that many ambitious ventures failed, for example Webvan, Streamline and Shoplink, and some were taken over by traditional retailers, such as Peapod by Ahold (Wydra and Martin, 1997). On the other hand, other players have managed to make their Internet sales channels profitable, such as UK-based Tesco and Albertson's in the USA. In 2005, Tesco.com reports 150.000 orders per week, a total of 750.000 customers and a profit of £36 million (Tesco, 2005). A Scandinavian player, Aarstiderne (<http://www.aarstiderne.com>) operates since 1999, delivering ecological produce to their online customers. The customer base in Denmark and Sweden is currently 35.000 customers.

Nettmarket.com is a Finnish online grocery store, operating in a partnership with a purely physical wholesale business, picking groceries directly from the wholesaler's outlet, thus avoiding costs on warehousing, product losses, burglary and the employment of cash counter personnel (Anckar et

al., 2002). The benefits of the model are many, but as the customer base continued to grow slowly, Nettimarket.com was struggling to make ends meet. When the city of Turku announced its desire to outsource the city's grocery shopping services for the elderly and disabled to a supplier with experience in online grocery retailing, it was clear that Nettimarket.com would compete for this deal.

3. Providing groceries for the elderly and disabled in Turku

One of the open care services' tasks is helping customers with their grocery shopping. The average number of open care customers in Turku is annually approximately 4000, of which the majority is old people. Up until 1999, the home help workers took care of grocery shopping for all those customers who cannot do it themselves. In this model the home help worker goes to the customer's home, writes a shopping list with the customer, receives money from the customer and then goes to the closest shop to buy the groceries, brings the groceries to the customer's home, unpacks them, reports on how the money was used and returns change. The social service's own calculations of the employees' working time showed that one shopping trip for one customer took on average about 45 minutes (Sosiaalilautakunta, 1999), meaning that an employee spent a significant portion of his or her working hours outside the customer's home. A Finnish study of open care services showed that grocery shopping took on average one third of the time reserved to a client (Lind and Pietala, 1997). According to calculations made by two of the four districts in Turku, buying groceries took 874 working hours a week in the old system, which translates to the work contribution of 22 employees (Heinonen et al., 2002). Consequently, the traditional way of shopping groceries for the customers means that the employees' time is partly being misspent on a physically straining task that does not require competence and experience in elderly care. There have also been changes in society that increase the problems for home help shopping. Koski et al. (1998) and Lind & Pietala (1997) report on the network of shops in Finland becoming less dense, which causes inequality among the population and difficulties for taking care of home help customers.

At the beginning of 1999, the open care managers observed that the imbalance between the demand for services and the resources of the social services was becoming unmanageable. Some services might have to be outsourced to a private service provider as had already been done in several municipalities in Finland. Grocery

shopping, laundry, transportation and cleaning were listed as potential targets for outsourcing. All of these were services that to a significant degree take place outside of the customer's home. In the discussions that followed grocery shopping came up as a strong candidate for outsourcing, and there was already some experience of similar arrangements in three other cities in Finland. The social services was especially interested in making a contract with a company that utilises information technology (i.e. the Internet and e-mail) to collect the orders. This was seen as the best way to streamline the shopping service (Sosiaalilautakunta, 1999). Nettimarket Oy was chosen from a pool of nine entrepreneurs in a competitive bidding to deliver the service for a test period of one year (1999-2000) in two of the four service districts, the western and the northern. The southern and the eastern district implemented the new practice in December 2001, at which point the total number of home help grocery service customers was approximately 800. Nettimarket Oy was again chosen as the supplier. According to the board meeting minutes of the social services of Turku, the reasons for choosing Nettimarket was a sum of many factors. Nettimarket was one of the two competitors that had experience and an already working model for undertaking such an extensive service. Finally, the price for the delivery and the quality, stability and service security of the system tilted the scales in favour of Nettimarket (Sosiaalilautakunta, 1999).

In discussions with Nettimarket's manager Aki Teranto the managers planned the best way to organise the service. The city was interested in acquiring Nokia Communicators to be used for ordering the groceries, whereas Mr. Teranto proposed the use of PCs. The city decided on purchasing communicators, on the grounds that a communicator can be taken to the customer's home which maximises time savings, and it can also be used as a telephone, which all recess quarters did not have at the time. In practice, the communicators were never mobile, since only one device per recess quarter could be bought, and it had to be shared by approximately 20 employees. According to the agreement between Nettimarket and the city of Turku, the city pays Nettimarket 7 euros per delivery, of which the customer pays a small part (1.60 euros). The home help worker makes in the customer's home a list of the groceries, goes to the workers' recess quarters where he or she types them into a communicator, and sends the order electronically to Nettimarket. The number of grocery shopping deliveries to the open care customers during the first year of operation (1999-2000) was predicted to be approximately 1300 a week. According to the

social service's own estimation cost savings would be approximately 0.9 million euros a year. The costs for the outsourced service were estimated to be 0.4 million euros, out of which the customer would pay 0.25 million euros (1.6 euros per delivery).

The customers are expected to take part in the new system en masse. In other words, all open care customers in need of help in grocery shopping have to get their groceries from the online store. An exception is made if the customer comes along to the store. In these cases the exercise and activity is regarded as rehabilitation and important for maintaining these customers' physical and mental health (Heinonen, 2003; Heino, 1999).

4. Achieving efficiency by outsourcing the grocery service

Outsourcing is essentially the transfer of ownership of a business process to a supplier (Anon., 2003). A key characteristic is the transfer of control over the process, i.e. the buyer does not tell the supplier how to do the work. The buyer's focus is on conveying the results it wants to pay for, accomplishing those results is up to the supplier. Chaffey et al. (2003) lists a number of reasons for outsourcing, of which the following apply to the case at hand: freeing resources for other purposes; the function is difficult to manage or out of control; improving the organisation's focus and the fact that resources are not available internally. Possible problems related to outsourcing can include concerns over the qualifications of the outside personnel, the loss of control over the function, the negative impact on employee morale and that the expected cost reductions are not reached (Chaffey et al., 2003).

The Finnish Competition Authority (Kilpailuvirasto, 2001) states that the Finnish municipalities that are outsourcing some of their social and health services are mainly aiming at evening out peak times in the usage of services, for instance in the Turku shopping service there is a peak amount of grocery orders before major holidays, which means that the city has to be able to mobilise more employees than usually. Another goal is reducing labour and capital expenditure (Kilpailuvirasto, 2001). The managerial challenge of reaching outsourcing success is to correctly identify the organisation's core competencies and to strategically outsource other, non-core activities which the organisation has no special capabilities to deal with and for which there is no special strategic need (Greco, 1997; Quinn and Hilmer, 1995). According to the Finnish Competition Authority, municipalities in Finland have

outsourced core activities as well as fringe services. In the Turku city case, though, the management team was quite determined on retaining core activities under city control. The core competence of the organisation was defined as the operations done in the customer's home, whereas all other operations could in principle be outsourced (Hassinen-Laine, 2003). Regarding the grocery shopping service for the customers, the whole service is not outsourced, since the city home help workers are still in charge of order taking and relaying them on to the supplier. This is directly related to the desire to keep the functions with client interaction in the control of the city open care services, and to the need to monitor the client's health. The customers' eating habits and changes in them give important clues to their general well being.

The outsourcing of public sector services in Finland has as a rule been limited to situations in which the public sector service provider complements its own insufficient production capacity with services bought from the markets or the service has not been part of its service production. It is very rare in Finland that the whole service production is outsourced (Sasi and Aho, 2001). For our purposes outsourcing could be divided in three degrees or categories. Let us call it (i) the first degree of outsourcing when an organisation complements its own insufficient production while maintaining a significant degree of control over the production process and is even partly involved in it. Let us call it (ii) the second degree of outsourcing when control over some part of the service production is given over to an outsider and the public sector organisation merely oversees the results but does not interfere with the production process itself. The second degree of outsourcing entails both that the open care organisation has made the service into a clearly defined product that can be sold on the market and that they have also created some benchmarking system by which to supervise the quality of the outsourced service. Let us call it outsourcing of (iii) the third degree when the whole production is turned over to a third party (e.g. the railways in Great Britain). The shopping service in Turku belongs to the first category, and it is presently shifting towards the second category (see Figure 1). Generally speaking, Turku is, along with other Finnish municipalities, gradually changing from a service producer to a service organiser (see Liukko and Luukkonen, 2002; Valkama et al., 2002). What makes Turku's case of outsourcing even more interesting is that there is a tendency towards a partnership with the private entrepreneur, which does not quite tally with the outsourcing arrangements. Partnership is a viable alternative but it requires more time and it

is not clear how it could be reconciled with the entrepreneur's freedom of arranging the production processes.

The main benefits that are usually sought after when outsourcing are related to 1) streamlining processes and flows of goods and information within supply chains, and to 2) reducing costs related to e.g. monitoring of performance and hiring, management and training of personnel (Lacity and Hirschheim, 1993; Rabinovich et al., 1999). Kanniainen (2002) states one benefit of outsourcing in the municipal health and social services to be the fact that 3) comparing the price-quality ratio becomes possible and comparisons between external and internal suppliers can be done. Compared with outsourcing theory, expectations from outsourcing the Turku city grocery service are somewhat different. The city mainly sought after a) lightening the physical burden on their personnel and thus improving employee health; b) being able to focus on their core competence, i.e. basic care within the

bounds of the customer's home, and c) saving time and being able to provide their services to a wider circle of elderly and disabled. Savings in the expenditure of money on substitute workers were seen as possible, but were not the main benefits expected or motivating the outsourcing decision. An overview of the involved parties and the interactions between them are presented in Figure 1. Arrows indicate the interactions between the parties, including the flow of information, the formal control used by the social service department and the management, and the decision to outsource the grocery shopping service. Besides the formal control we could notice an informal control function employed by the home help workers in order to maintain the quality of the service delivered by the service provider. As the home help workers were part of the service process they became the spokesmen for both the customers and the city of Turku, thus maintaining an effective informal control of the process.

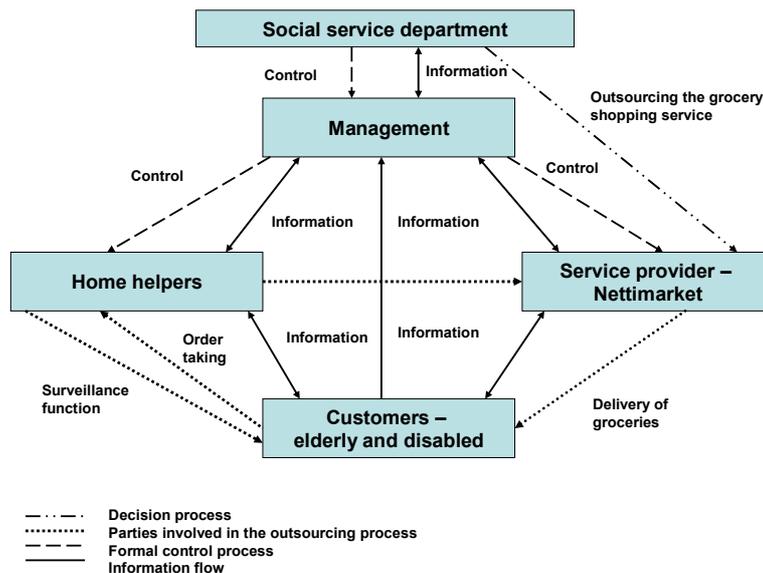


Figure 1: Overview of involved parties and interactions

The management and the home help workers had their own, different sets of expectations, shaped by their experience of the downsides of the system before outsourcing, which will be discussed in the following sections.

5. Method

Our approach is twofold. On the one hand, we have conducted surveys on both the employee and customer populations of the city's grocery shopping service, and subjected these to statistical analysis. This material has then been

combined with ethnographical material, for instance in the form of interviews and letters to the editor of the local newspaper. Two researchers conducted interviews with the department heads of the four open care districts. Each interview lasted between one and two hours. The interviews were recorded and transcribed.

The statistics show that by outsourcing grocery shopping to an electronic commerce player has improved the efficiency of open care but this efficiency translates into different experiences to each stakeholder. Based on the ethnographical materials gathered over the years – i.e. starting

soon after Nettimarket.com was founded in 1998 – the traditional efficiency criteria of outsourcing are partly reinterpreted in order to do justice to all stakeholders. The objective of combining the two methods is to construct a more comprehensive picture of the development of public sector services at the open care of Turku.

6. Management expectations from outsourcing the grocery shopping service and experiences

The four open care service districts are each headed by an open care manager who coordinates the services in his or her district and takes care of strategic planning together with the other open care managers and the social services department head. The management estimated that the outsourced online grocery shopping service would give the employees more time to focus on their core activity, which is basic care. In other words, saving time was the principal reason for the outsourcing decision. In this way the customers could also count on getting good quality care in the future, as the resources were not increasing in step with the workload. The managers also hoped to be able to take on a larger number of customers, since at that time they could only take care of those customers with the most urgent needs, and many persons in need had to be excluded from the services (Rauhala, 2003; Salmiosalo, 2003; Heinonen, 2003). Some of the main expectations the city placed on outsourcing the grocery shopping process were related to employee health. The mean age of the open care staff is in some sub-districts even above 50, which is higher than the already high city employee average age of 43. The risk of injuries and accidents while hauling large amounts of groceries was quite real. Also, employees were reporting strain and pains in the neck and back area and early retirement was common. The managers also wanted to minimise the employees' need to handle the customers' money, which inevitably sometimes leads to misunderstandings and distrust (Hassinen-Laine, 2003).

Another important consideration was equality. In the old system of delivering groceries, the customers living in different parts of the city could not receive service of comparable quality. Home help customers living in the heart of the city had a large selection of stores within reach, and in the old system their shopping service may have consisted of an escort in a taxi to the finest stores in the city. On the other hand, customers living in the remote, rural parts of the city only had access to significantly more modest stores and smaller product assortments, since all customers were

taken to the stores nearest to their homes. In the name of equality, the city wanted to provide the same level of service for everyone, regardless of neighbourhood. The old system was not unfair for the customers alone, but for the employees, too, because the working conditions and work strenuousness were very different in different districts (Rauhala, 2003; Salmiosalo, 2003). There were also some expectations of cost savings. When preparing the decision of conducting the first outsourcing trial in 1999, two of the open care managers expected cost savings due to fewer sick leave days and lower need of hiring substitute workers since one physically heavy part of the job would be taken care of by outsiders. The managers also supposed savings would be gained from lower expenses on car acquisitions, petrol, repairs and mileage allowances (Sosiaalilautakunta, 1999).

Finally, the managers were interested in utilising information technology for arranging the service. In their view, this was the best and smoothest way to organise the ordering, and also the only way they would be able to maintain service at an acceptable level. One of the open-care managers stated that as the proportion of elderly and disabled people steadily increases, there is a need to use efficient platforms and tools enabling the provision of a better service (Anckar et al., 2001). Expectations placed on the specific value of ICT in this context were quite vague, but in general it was expected to be a fast and efficient way of ordering that would enable accurate and fast deliveries. In some other Finnish cities the grocery shopping service had already been outsourced, according to a model where open care workers relay the orders to a retailer, who picks and packs the goods, which are then picked up by a separate transport company who delivers them to the customer. In Turku the managers were interested in outsourcing to an entrepreneur who handles the whole chain (Sosiaalilautakunta, 1999). According to the home help directors of Turku, shortly after the first test period of online grocery service had begun in 1999, both the customers and the employees reacted at first by reminiscing about all the good things that were related to the old system. The customers missed their corner shop and its inexpensive prices and familiar assortment. The home help workers told the directors that they missed the trips to the corner shop because they could disengage themselves from their regular work for a brief moment while doing those tasks. One of the management's main tasks during implementation and the first year of the service was to defend the service to concerned customers and family members, and to convince the employees of the reasons and objectives behind the new system.

Some efforts were made to explain also in local media the social services' reasons for resorting to outsourcing, in response to newspaper writings suggesting that here the city was cutting costs and saving time but it was unclear what the customers would get in return (Salmiosalo, 2003; Anon., 1999; Enkvist, 2002; Anon., 2002; Anon., 2002). This situation was quite stressful on the managers and raised uncertainty among them whether the general population of customers were unhappy or only a vocal minority of them. The situation calmed down with time and at the end of 2002 the managers reported that new customers with no experience of the old system seem very pleased with the online grocery service. It seems to the managers, as if also those customers who do have experience of the old system have overcome their change resistance.

There are clear indications of the fact that the management expectations of improved employee health were realised. In our interviews the managers shared results from an internal questionnaire indicating that physical strain had diminished due to the online grocery service. This was further backed up by evidence of reduced expenditure on substitute workers. The managers also reported that many home help workers have informed their superiors that they now have more time for the basic care. It has also become possible to take on new customers and increase the portion of work done in the evenings and weekends, for which there is great need among the customers. The employees also reported less pain in their neck, shoulders, back and arms. Another perceived benefit is that the structure of their working day is clearer than before (Heinonen et al., 2002).

7. Employee expectations and experiences

There are approximately 600 open care employees in the city of Turku (employee numbers change on a monthly basis, fluctuating between 590 and 610), divided rather equally into the four service districts. A 24-question questionnaire was distributed to all of them through the district managers. 195 of the employees responded, which is approximately 32 % of the entire population. In addition to demographic questions, the employees were asked to give their opinion on different aspects of the online grocery service on a 5-point Likert scale: 5 = Completely agree, 4 = Partly agree, 3 = Do not agree nor disagree, 2 = Partly disagree, 1 = Completely disagree. We included the possibility 0 = Cannot say / no opinion as we assumed that there might be employees with no experiences from the period before the

outsourcing. All calculations for the different statements have been done after excluding those recipients who answered that they "cannot say / have no opinion". For a summary of the results from the employee survey, see Table 1.

Table 1 compares the combined results from the two districts that entered the online grocery service first, in 1999 (northern and western), and the two districts that joined the service two years or more from that, in 2001-2002 (eastern and southern). The means for the two groups were tested for differences between them through conducting an independent samples t-test. Levene's test was run to test for equality of variances. Where significant differences in variance were found, a more conservative, adjusted t-test was applied. The mean age of employees who responded to the questionnaire is 44 years, the youngest being 19 and the oldest 62. 34.7 % of the employees belong to the oldest age group, 51-64-year olds, and 42.6 % to the second oldest group, 36-50-year-olds. There are no significant differences in age distribution between the different districts. The age distribution corresponds well to the actual age structure of the population. Among the 195 respondents there are only two men. The respondents are evenly divided between the four districts; 49 respondents work in the southern and western districts each, 41 in the northern and 54 in the eastern district. The respondents have worked in their positions from 0 to 30 years, mean value being 12 years 6 months. Respondents were polled on the expected and perceived effects of outsourcing on their work (see Table 1 for summary statistics on perceived effects). One third of the respondents hoped that the online grocery service would improve the availability of other services but as many as 41 % feared that the new practice would deteriorate the grocery shopping service. Many employees have seen the deterioration of the open care service through the years and suffer from working at a hectic pace and knowing they do not have enough time for every customer. The employees feel inadequate, and they also are the ones who hear customer complaints directly and frequently. In 1997, the open care workers had been asked what they wished to develop in their work in the future. The clearly most frequent answer was "to have more time for the old people" (Suhonen and Hakala, 1998).

Most home help employees (87 %) that responded to the questionnaire had expected that their physical workload would diminish when an outside service provider would do the grocery shopping. On the other hand, 28% expected that the online grocery service would make their work

more mentally straining. When asked about the actual perceived effect of the service on their work, a third of the respondents declared that the mental strain of their work had in fact diminished. In the two districts that had longer experience of the service, around half of the respondents were of that opinion, however, whereas less than one fifth were of that opinion in the other two districts. Opinions on the physical strain of the work are divided according to the following pattern: 93,6 % and 90,4 %, of the respondents from the first-comer districts agreed with the claim that the physical strain had diminished, whereas the respective percentage in the latecomer districts was 71,1 %, that is, on average 84,6 % agreed. It

is evident that on the whole the western and the northern districts have a more favourable opinion on the online grocery service than do the latecomers, the eastern and southern districts. Comments by the employees from the eastern and southern districts indicate that their opinions have been influenced by the short time that the service has been in use, since many employees have not yet gotten used to or learned to use the system. Dealing with an unfamiliar way of ordering, added to the fact that many of the employees are not technologically knowledgeable from before, means added mental strain until they feel more comfortable with the process (see Sell et al., 2003 for more details).

Table 1: Employee opinions - summary statistics (N=195)

<i>Effect on work character</i>	Agree**	Disagree***	Mean (all respondents)	SD	Mean, new districts	Mean, old districts
Has lessened physical work load	84.6 %	8.0 %	4.24	1.08	4.01	4.54
I have more time per customer	43.0 %	37.6 %	3.01	1.39	2.57	3.62
Has lessened mental work load	31.5 %	52.5 %	2.64	1.39	2.22	3.17
Other services have improved	23.2 %	48.8 %	2.51	1.14	2.18	2.94
<i>Ordering from online grocery store</i>						
Ordering is easy	74.5 %	16.8 %	3.87	1.21	3.60	4.20
Ordering is fast	61.1 %	23.8 %	3.57	1.26	3.20	4.01
Finding products in the website is easy	22.6 %	46.6 %	2.56	1.23	2.22	3.04
<i>Products</i>						
Enough different brands	57.0 %	21.5 %	3.45	1.14	3.48	3.46
Product range is wide enough	52.2 %	28.3 %	3.32	1.19	3.27	3.41
Delivered goods are fresh and high-quality	47.3 %	30.1 %	3.18	1.08	3.21	3.17
Groceries are reasonably priced	14.7 %	74.5 %	1.95	1.13	1.86	2.08
<i>Delivery</i>						
Delivery service is friendly	65.2 %	13.0 %	3.78	1.06	3.62	3.96
Delivery service is business-like	62.7 %	18.9 %	3.63	1.05	3.48	3.83
Deliveries correspond to order well	52.2 %	29.0 %	3.24	1.05	3.22	3.25
Deliveries come on time	54.8 %	33.0 %	3.23	1.21	3.03	3.47
Delivery service is reasonably priced	30.8 %	56.0 %	2.44	1.35	2.27	2.65
<i>Service</i>						
Payment options are sufficient	82.2 %	6.7 %	4.23	1.00	4.12	4.34
Mistakes are corrected satisfactorily	80.6 %	9.4 %	4.08	1.07	3.94	4.24
Invoices are correct	58.5 %	27.3 %	3.43	1.14	3.39	3.46
<i>General</i>						
On the whole the shopping service works well	54.1 %	25.1 %	3.35	1.10	3.13	3.64
Shopping is taken care of better than before	18.9 %	51.5 %	2.50	1.14	2.15	3.01

**) Percentage of employees who responded agree (5) or partly agree (4)

***) Percentage of employees who responded disagree (1) or partly disagree (2)

Bold value: Difference of means between old and new districts is significant (p<0.05)

One of the employees' main wishes before the outsourcing was having more time per customer, and 43 % of the employees agreed that outsourcing had had this effect. As resources were freed, the city could take on new customers in addition to the old ones, which explains that the total time spent per customer did not rise in all cases, as the employees had more customers to take care of. Employees were also asked whether they feel that the grocery shopping service has improved after the outsourcing. Only 18.9 % could agree with this statement (29.6 % of the opinion that the service has stayed the same). The old system of doing the grocery shopping was at best highly individual and customer-focused. One of the open care managers (Rauhala, 2003) states

that for instance for those customers who lived in the vicinity of good stores, the old system was almost luxurious, but it should be kept in mind that this level of service could not be provided to all, for instance to those living in rural areas of the city with long distances to the closest store, often with a modest product range. A small number of respondents explicitly wished for the old system back, i.e. doing the shopping themselves. Some respondents also hoped that the online store and the traditional model could be somehow combined ("A person who eats little does not need to order groceries twice a week; for instance, first one milk, two sour milks – could it not be fetched from the corner shop?"). The fact that the customers were not provided with a product catalogue listing

Nettmarket's offerings, made ordering more difficult. The technology used when ordering sometimes caused problems. Approximately half of the respondents either always or usually send their orders to Nettmarket by e-mail via a Nokia Communicator. Almost one fourth either always or usually orders by a computer via the Nettmarket web pages (<http://www.nettmarket.com>). Some respondents said that the small screen and the small keyboard made using the Communicator difficult. It seems that Nokia Communicators were perhaps not the best possible device for social services' purposes. Due to a shortage of Communicators they were severely under-utilised, serving as stationary terminals instead of mobile devices. Despite the drawbacks, a majority of those who used them found them easy to use and handy. Also, on the other hand, some respondents said that ordering through the web site (with PC) was difficult because of the product search functions, which were found to be deficient and cumbersome. Both Nettmarket's delivery service and product prices were thought to be expensive. The employees from the western and northern districts, where the online grocery service has been in use already from the year 1999, were more prone to think that the delivery service fee is reasonable than the respondents working in districts that had joined the service later. Both groups found the grocery prices too high. The first-comer districts had a more favourable opinion of the decency and friendliness of the delivery service. The open care employees expressed most satisfaction with the payment methods, correcting of mistakes and the ease of ordering. The employees also wished for many improvements regarding the available product range, some real, but some that showed a lack of knowledge of Nettmarket's selection. For instance, many employees hoped for the possibility to order fresh fish, which in fact was possible.

8. Customer experiences

A questionnaire was distributed to all of the grocery shopping service customers, and 198 of the 600 responded (33 %). Of the customers responding to the grocery shopping service questionnaire, the predominant majority, 81.3 %, is female. The age range of respondents is between 44 and 99 years, but most of the respondents, 77.3 %, fall within the age range 71-90 years. Only two respondents (1.0 %) are under 50 years old. The respondents are not computer or Internet users themselves; only two individuals report using them weekly and two others have tried using them. The grocery shopping service is the respondents' main source of groceries, but 29.7 % of the respondents also supplement with

groceries from other sources, bought by themselves or their relatives and friends. The grocery shopping service is sufficient as a source of groceries for 40.5 % of respondents. The respondents get groceries delivered through the grocery shopping service once a week (61.3 %) or two to three times a week (31.4 %). A summary of the customers' experiences can be found in Table 2.

Most of the customers (79 %) were of the opinion that through outsourcing the grocery shopping had either improved or stayed the same, but 22 % felt the service had deteriorated. An almost identical distribution of answers was received for the question; whether the other services that the customers receive from open care had improved, i.e. if outsourcing the grocery shopping had enabled open care employees to take better care of their customers. 80 % answered that the other services had improved or neither improved nor deteriorated and only 20 % thought they had taken a turn for the worse. Pricing issues were the main source of dissatisfaction for the clients. 49.7 % of the respondents were of the opinion that the products are not reasonably priced, and 36 % felt that the delivery service itself was not reasonably priced. Otherwise the customers were quite satisfied with the different aspects of the outsourced grocery shopping service. The customers were especially pleased with the service quality; over 92 % of the customers felt that the delivery service was friendly and decent. For many customers, the delivery of groceries was a welcome diversion to their day. The online grocer saw the importance of this social contact to the customers and was highly successful in maintaining a high standard of customer service. Friendly and business-like customer service was a staple of the delivery service and highly valued by the customers. The width of the product range was found sufficient by a majority of the respondents, but 20 % of the respondents hoped for more width and also for certain brands to be included in the product range. When comparing the customer opinions with the employee opinions, it is noticeable that the customers are overall more satisfied with the different aspects of the service. It is likely, that the employees' position as "guardians" of their customers' interests influenced their opinions in a more negative direction. They were the ones overseeing and facilitating a large number of customer transactions and if there were problems, they were involved in sorting them out. The employees' opinions regarding the friendliness of the customer service were especially far from the customers' opinions; almost all (94.1 %) of the customers thought the customer service was friendly, whereas only two thirds of the employees

were of the same opinion. The customers were also much more satisfied with the timeliness of the deliveries. This might eventually be explained by a

higher sense of urgency felt by the employees, who were following a tight schedule to manage all the customer visits of their working day.

Table 2 – Customer opinions, summary statistics (N=198)

Products	Agree*	Disagree*	Mean	SD
Enough different brands	59.1%	18.7%	3.62	1.25
Product range is wide enough	68.5%	19.4%	3.73	1.27
Delivered goods are fresh and high-quality	72.6%	20.3%	3.86	1.19
Groceries are reasonably priced	33.7%	49.7%	2.68	1.37
Delivery				
Delivery service is friendly	94.1%	2.4%	4.58	0.73
Delivery service is business-like	92.3%	3.0%	4.48	0.77
Deliveries correspond well to order	72.7%	18.7%	3.84	1.19
Deliveries come on time	80.0%	12.6%	4.05	1.11
Delivery service is reasonably priced	46.5%	25.9%	3.11	1.41
Service				
Payment options are sufficient	89.3%	4.2%	4.56	0.86
Mistakes are corrected satisfactorily	81.7%	8.0%	4.27	1.05
Invoices are correct	79.3%	13.4%	4.18	1.17
General				
On the whole, the shopping service works well	76.1%	11.0%	4.04	1.17

*) Percentage of customers who responded agree (5) or partly agree (4)

**) Percentage of customers who responded disagree (1) or partly disagree (2)

9. Three stakeholder perspectives on efficiency

Table 3 below lays out the efficiency improvements brought about by outsourcing. The efficiency criteria derive from mainstream outsourcing theory, but in some cases they are reinterpreted in order to do justice to the three

stakeholder perspectives: the managers, the home helpers and the open care customers. By stakeholders is here meant identifiable and influential groups of actors who (i) contribute to the valued resources; (ii) put these resources at risk or experience costs if the system fails; (iii) and have power in or over the organisation (Frooman, 1999; Kochan and Rubinstein, 2000; Mitchell et al., 1997).

Table 3 - Efficiency matrix of grocery shopping service – do traditional criteria of outsourcing efficiency apply to the different stakeholders and was efficiency achieved?

	Stakeholders		
	Managers	Home helpers	Elderly and disabled customers
Time	Yes -More customers in same time	Reformulate -More time efficient -Time freed to concentrate on tasks suitable for their experience and competence -Less stress	Reformulate (time efficiency definition inverted for this group) -Punctuality -Flexibility, suits their daily routines -More variety -More predictable, reliable -As a group, more time; on the individual level no change or more time
Costs	Yes -Less sick days, stand-in workers -Reduced expenditure on mileage allowances	Yes/Reformulate -Less "wear and tear" (on the "machines" of this system) → long-term savings in personal expenditure (health-related costs, prolonged prospect to work) -Quality of life is improved	No -Myth of cheaper shopping online not true (self-service → service) -Small average order size, fixed transport fee
Stream-lining processes	Yes	Yes	No , no relevant changes -Not more efficient, procedure a little different -Two visitors better than one from many customers' view point -Procedure no more difficult
Quality	Yes Price/quality ratio	Yes -They can concentrate on their core competence	Yes - Good grocery quality - Good service quality - Width and breadth of assortment

The first column of the table maps out the realised outcome of outsourcing from the managers' viewpoint. The managers' efficiency criteria conform rather closely to the conventional outsourcing efficiency criteria. Timesavings were attained because the online grocery service gives the open care service unit more time for caring in absolute terms. However, the time saved was reallocated to a larger customer group, that is, the unit took in more customers. The costs were cut thanks to less sick days, stand-in workers and reduced expenditure on mileage allowances for home-helpers. The quality criterion was realised in terms of improved price/quality ratio; better quality with less money. The second column maps out how the efficiency criteria are realised from the home-helpers' viewpoint. Savings of time were gained from the home-helpers' perspective, too, but time needs to be reinterpreted in this context in order to appreciate the motives and goals of this particular stakeholder. Collectively, the home-helpers saved time. Individually, they did not get more time because they got more customers. However, they can now allocate their time differently, concentrating on caring, which is their core competence. The shift to the online grocery system means cost savings for the home-helpers as their prospect of lifetime working time increased thanks to lessened physical and mental strain. The home-helpers have now one work process less, which translates into streamlining of processes. Likewise, being able to focus on their core competence translates into improved quality.

The third and last column shows the efficiency criteria from the customers' point of view. Timesavings as an outsourcing efficiency criterion can be applied to the customers but needs to be reformulated, or rather, inverted. We reinterpret time for this group of stakeholders as follows. The elderly and disabled got more time spent on them (i.e. more service) as a group but not individually. Because the online grocery service takes care of the groceries and the home helpers now concentrate more on caring, efficiency for the customers can on the one hand be reinterpreted as increased punctuality, flexibility and reliability and on the other hand as increased quality time. Moreover, the elderly and disabled customers generally experienced the grocery delivery workers as a new stimulating contact: the customers were pleased the most with the delivery service (see Table 2). All in all, one could say that the customers' got more quality time. From the customers' viewpoint, the costs of the online grocery service were not lower than the costs of the old service, so the cost savings did not take place. On the contrary, relatively high product prices, the small average order size and the fixed transport fee drove the total price per a

shopping bag higher than in conventional stores. What comes to the criterion of streamlined processes, the customers experienced no significant difference between the old and the new grocery systems. Lastly, the quality of online grocery products got better as the products were handpicked from the wholesaler's outlet, translating into improved quality.

10. Benefits and shortcomings of outsourcing

The home help customers are far from typical online grocery customers. According to research literature, typical online grocery customers are families with children, women under 45, and people with a high social status and high income. These customer groups are little concerned with price when choosing where to buy their groceries. In addition to this, in an online grocery store the average purchase is three times larger and the frequency of purchases is also significantly lower online than in a conventional store (see Jarvela and Tinnila, 2000). As the home help customers as a rule live alone and buy only small amounts of groceries at a time, they miss out on some significant advantages offered by online grocery shopping. One of the goals of outsourcing was that all customers would be treated equally, which goal was achieved. There is a group of customers who already had access to very good shops with broad product ranges. For them, the new system meant a deterioration of the shopping service (22 % of the customer respondents felt that the shopping service had deteriorated). A clear majority of the customer's felt that the shopping service had become better or stayed the same (79 %). At least part of these are the customers who previously had access to smaller stores with a modest product range.

Cost savings in the Finnish public sector are hard to verify mainly because the public sector usually has not made such cost calculations, which would enable comparison. In the case of Turku cost savings were not a priority, managing basic care was, but there are clear indications of cost savings all the same. Already in 2000, the managers presented the city social board with information suggesting that savings had been made through less need of money for substitute workers and compensations for the employees' use of own cars. However, the saved resources were not cashed in but went straight to the solidification of the core activities of open care and to the widening of the customer basis. Better quality, as an expected outcome of outsourcing, usually shows in the form of more customer-friendly service and increased flexibility (see e.g. Sasi and Aho, 2001). The empirical findings

indicate that the customers were satisfied and in some areas very satisfied with the online grocery service. On the other hand, flexibility cannot be said to have increased significantly. Especially the open care workers had at times difficulties when trying to mediate the customers' wishes and complaints to Nettimarket. Partly these difficulties can be interpreted as an outcome of unclear roles (partnership or bought service), lack of benchmarking and confusion about what is the service as a product to be sold to an outsider. The two last-mentioned requirements for open competition are stated in the Finnish law of acquisitions, although in practice they are not always possible to make come true (Oksanen, 2002). However, partly the inflexibilities owe to the contingencies of human relations.

One of the most important goals was to diminish the physical workload of the employees, to prevent and minimise sick days, premature retirement and work-related injuries. This goal was achieved. Some workers felt, however, that the emotional and mental workload had become greater. This is largely due to the difficulty of adapting to change and a certain amount of resistance to technology. Many of the workers did not have earlier experience in dealing with technology, and felt anxiety before the task of learning and using a mobile device unfamiliar to them. This was likely to increase stress. The districts that had been in the system longer had clearly lower scores on the mental workload scale, indicating that the adoption of technology takes time but happens.

11. Conclusion

For the last decade or so the social services of Turku has been trying to meet growing service

demands with stagnant resources. In order to keep its core activities functional, social services resorted to outsourcing its grocery shopping service to an online grocery retailer. This was a bold move as online grocery shopping has not been as successful as was generally predicted in the early days of e-commerce. In addition to this, the open care customers are far from typical online grocery customers. As unlikely as it may have seemed in the beginning, the online grocery service has been in many ways a success. Together the private entrepreneur and the social services of Turku have discovered a hidden online market. When outsourcing, organisations are usually striving for time and cost savings, streamlining processes and an enhanced focus on their core competencies. For Turku, all of these benefits were achieved. Another important expected and realised benefit from outsourcing the grocery shopping service is employee well being. For the customers outsourcing meant receiving more equal customer service. Currently Turku is in the process of deepening its involvement in outsourcing, switching from the role of a service provider to that of a service organiser. After all that has been said above one should not think that all is well in the open care of Turku. The fact remains that in absolute terms the financial resources and manpower have stayed virtually the same at the same time as the number of customers and the workload have increased. However, outsourcing has helped in directing the resources where they are most needed: the hard core of open care.

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