

3G Technology in Local Government: Case Examples of Business Process Change and Strategic Innovation

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Abstract: *This paper reports some of the key findings from part of a larger research projects into the application of 3G technology in government and public sector applications. The work was sponsored by Vodafone UK plc. One of the key themes identified in the main research project was the importance of strategic innovation and business process change and how these organisational phenomena related to the application of 3G technology to either solve existing problems or create new opportunities to design new work practices. Three case studies examples are offered to illustrate this concept, including Citizens Advice Bureau, Manchester Advice, and the Single Assessment Process (SAP). Each of these organisations managed to implement significant changes to the ways that e-government services are organised and delivered. An overview of key research in the area of e-government is also given to place the application of 3G technology in a broader technology and organisational context.*

Keywords: 3G technology, mobile applications, government, e-government, public sector, strategic innovation, business process change.

1. Introduction

This paper reports some of the key findings from part of a larger research project into the application of 3G technology in government and public sector applications. The work was sponsored by Vodafone UK plc to investigate case examples of strategic innovation and business process change. The research project was conducted in 2004/2005 in a variety of organizational settings. One of the key themes identified in the main research project was the importance of 3G technology to either solve existing problems or create new opportunities to design new work practices. In order to evaluate the impact and use of 3G technology in a Government context a range of areas were evaluated. These included ease of use for the individual user, impact on groups, and changes to business processes.

Three main examples have been chosen to illustrate the concepts. These are Citizens Advice Bureau, Manchester Advice, and the Single Assessment Application developed by Formfill. Each of these areas are of national importance because they relate directly to initiatives or application areas that are common to all UK councils, and may be of relevance to broader international developments.

The citizens advice bureau is a nationally recognised service and has a high reputation for being able to offer high-quality, independent and impartial advice to citizens across a wide range of subject matters including debt counselling, consumer law, social matters and health. Manchester Advice offers a similar, and comparable service, but is tied to the local authority in which it resides; in this case Manchester City Council. The Single Assessment Application is an example of a leading-edge implementation of a new software system that captures and validates client data and manages the logic and flow of the data according to a set of pre-defined business processes and rules, in conjunction with the professional judgement of the assessor. The implementations of 3G technology in each of these domains are exemplary studies of how to achieve business benefits in e-government.

An overview of key research in the area of e-government is given. This is not meant to be an exhaustive review of the academic literature but is rather used to place the application of 3G technology in a broader technology and organisational context. The review of previous research focuses on the most relevant and influential sources of information and provides examples of international best practice, as well as identifying important research models for the *impact* (both strategic influences and changes to business processes) of new technology into e-government.

2. Literature Review

2.1. E-Government

There have been few empirical studies of e-Government in practice compared with empirical research into commercial business in areas such as enterprise computing, internet marketing and electronic commerce, where there is a wealth of business and academic publications. However this is starting to change and there are some notable exceptions to the dearth of e-Government research. This literature review presents, in turn, those research studies that have been influential in the business and academic literature, including Accenture (2004), the Maxwell School of Citizenship and Public Affairs (2002), Ke and Wei (2004), and others.

Accenture (2004) reports, year on year, the results of an international survey of e-government practice. The key findings from the most recent report are the identification of several key international trends. The first one is that business models of government are being enabled by new technology which is creating new possibilities for the organisation and delivery of government services. This recursive relationship between business innovation and IT capabilities is a well established concept from research into commercial organisations and similar results are now being observed in government organisations.

The second trend is that of increased business and technology integration both within a single government agency (vertical integration) and between separate agencies (horizontal integration between separate agencies, e.g. between social benefits and housing). A similar result was also observed by Landsbergen and Wolken (2001). Their influential research expands on notion of integration used by Accenture (2004) by proposing the idea of inter-operability. Landsberge and Wolken (2001) emphasised the need for all elements of the organisation to be integrated, specifically business processes, people and IT systems.

Another important trend identified was concerned with the increasing sophistication of government services in terms of the breadth and the scale of the on-line government services, and that leading governments are attempting to personalise services in much the same way that commercial retailers and financial services companies have implemented initiatives to offer services that are tailored to specific individual requirements. In the context of the stages of growth concept, the most advanced e-government institutions continue to develop. These results and observation concerning the on-going improvement of services and sophistication regarding the use of IT suggest that *all* e-government programmes move through distinctive phases of development and maturity. This 'stages of growth' concept was first identified by Gibson and Nolan (1974) and subsequently developed by a number of authors (e.g. Galliers and Sutherland 1981).

Recognising such distinctive phases of development, the Maxwell School of Citizenship and Public Affairs (2002) sought to identify those characteristics that distinguished IT leaders from the laggards. The project included a detailed survey of a broad spectrum of IT strategies in 50 States, 43 cities and 37 counties. The leaders had several characteristics that distinguished them from the laggards: (1) integrated IT architectures; (2) sophisticated strategic planning and evaluation of IT investments; (3) explicit links between IT strategy and managerial outcomes; (4) innovation in service delivery and innovation regarding areas such as e-democracy; (5) smart IT procurement and (6) formal training activities. The IT architectures are concerned with how information systems (e.g. finance, HR and capital management), and services (e.g. social, housing, and education) are integrated. The use of 3G technology has clear potential for extending the levels of

integration with mobile workers and it is interesting to note that integration is one of the most important areas identified in the Maxwell School study, which is in common with Accenture (2004).

Ke and Wei (2004) carried out a strategic analysis of e-government evolution in Singapore (Singapore was identified as one of the clear world leaders in e-government in the Accenture survey) in order to analyse the reasons behind the success of e-government in Singapore. This research is important because it identifies important insights from an e-government innovator over a long period of time (1981 to 2004). It is also one of the best illustrations of how a single government moves through distinct stages of growth as it becomes more knowledgeable and sophisticated about the use of IT and e-government processes. Singapore was one of the first countries in the world to start to implement e-government with its Civil Service Computerization Programme from 1981 – 1985 which was followed by two national IT plans to the present Infocomm 21 that started in 2000. One of the important outcomes from the early initiatives is the creation of a standard IT infrastructure across all government agencies and their wider eco-system including suppliers and business partners. This has made it much easier to implement the vision of ‘many agencies, one government’.

Norris and Moon (2005) report the results of an extensive study into web applications in US government. They identified rapid growth in web applications in US local government but identified that the implementation of transactional based services, sometimes referred to as ‘back-office’ systems was much slower. This is significant because the US, together with Canada and Singapore, has been consistently identified as leaders in e-Government in the annual Accenture research studies.

Within the UK, there is a significant amount of pressure to increase the scale and scope of e-government services. Specific targets for the implementation of e-government services have been set out by the Office of the Deputy Prime Minister in a series of corporate plans titled the ‘Implementing Electronic Government (IEG) Statements’¹. These corporate statements set out in detail a staged evolution from 2001 through to 2006. Of critical importance to local government is the target of achieving online service delivery for all local government services in 2005.

On the performance of government services, the Gershon review sets specific targets for efficiency gains for the whole of government activities covering a range of work-streams, including procurement, back office – corporate support services, transactional services (like revenues and benefits), productive time (actions that increase productivity), and policy, funding and regulation (streamlining for both the public and private sectors including Local Area Agreements).

There are different views on the actual role of IT to deliver Gershon performance targets ranging from it being critical to most improvements to it being a relatively minor piece of the overall picture. However IT is an integral part of all back office functional systems. These are finance, human resources, payroll, ICT, legal, procurement, property, security and communications functions. Information and Communication Technology (ICT) is different to the other functional support areas because it has the potential to impact each of the corporate support services such as payroll and human resources, and it also directly affects the delivery of transactional services and levels of staff productivity.

2.2. 3G Technology

Mobile communications have evolved through three generations. The first generation of mobile systems in the 1970s and 1980s were analogue systems, and were used mainly for voice. Data could be transmitted with a modem but this capability was rarely used. Second generation mobile technology used digital voice systems and so-called 3.5G systems such as GPRS enabled email and internet access on a mobile device. 3G is the third generation of mobile system and allows multi-media applications through a high-speed

¹ see the local e-government web site <http://www.localgov.gov.uk/en/1/ieg.html> for further details.

wireless network that offers access speeds in the UK that are upto 384,000 bits per second, or about six times faster than a traditional dial-up internet connection and a third of the speed of a broadband connection.

The promise of 3G technology is to enable mobile workers to have full access to email, internet and office systems from remote locations through a wireless connection. This obviously gives a huge amount of freedom to mobile workers in government such as social service staff, housing officers, environmental workers and outreach workers such as Citizens Advice. Although there are clearly significant potential benefits for government services, social and individual citizens from the application of wireless technologies (e.g. see McCarthy and Miller 2003) there are few examples in practice and this study aims to remedy this in part by trialling the use of 3G and evaluating the outcomes around strategic innovation and business process change.

2.3. Summary

Several themes and research questions emerge from the literature review. How does new technology relate to strategic innovation and business process change? How should e-Government strategy achieve interoperability of IT systems, processes and people? What are the critical success factors for project implementation? How should the benefits be measured? This paper focuses on the first two questions and is the focus of interest in the case studies that are presented to illustrate the ideas and concepts in practice.

3. Research Framework

The methodology focuses on specific aspects of the implementation of 3G technology and the benefits that were gained over a three month period. An important tool for assessing changes to individual roles and business processes was to model how the business processes evolve as a result of the introduction of 3G technology and the emergence of new ideas and practices that arise because of the enabling effects of the technology. Previous research into the impacts of information technology on business has demonstrated that there is an interaction between the technology and the business strategy of the organization, as seen in figure 3.1. The business places demands on the IT, which in turn creates new possibilities for changing structures, systems and strategies. An important mechanism for relating business strategy to IT is to model business processes. Business processes are in effect a method for bridging the gap between high-level business strategies which are too vague to be used directly for systems design and the technical features of IT systems which do not relate naturally to strategy.

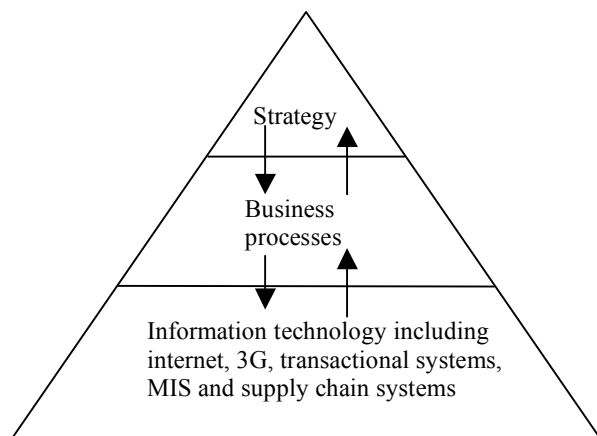


Figure 3.1 The inter-relationships between strategy, business process and IT systems

The overall strategy or purpose of a particular set of activities and the associated use of existing and proposed information technology was captured during interviews with the key informants. To capture the business processes used in the different settings a generic modelling notation was applied. The notation was

primarily used as a communication tool with those informants, but more significantly draws out key elements and changes to the overall work system.

4. Case Studies

4.1. Single Assessment Application: Formfill

Formfill is a software company that focuses on improving business processes through the utilisation of core technology in the areas of electronic forms, workflow, systems integration and electronic document and records management. One of its recent e-government projects has been to implement an integrated software solution for the single assessment process which is a department of health initiative designed to radically improve the care assessment needs for older people. It is based on a business process template developed by Cambridgeshire County Council otherwise known as CAT4.

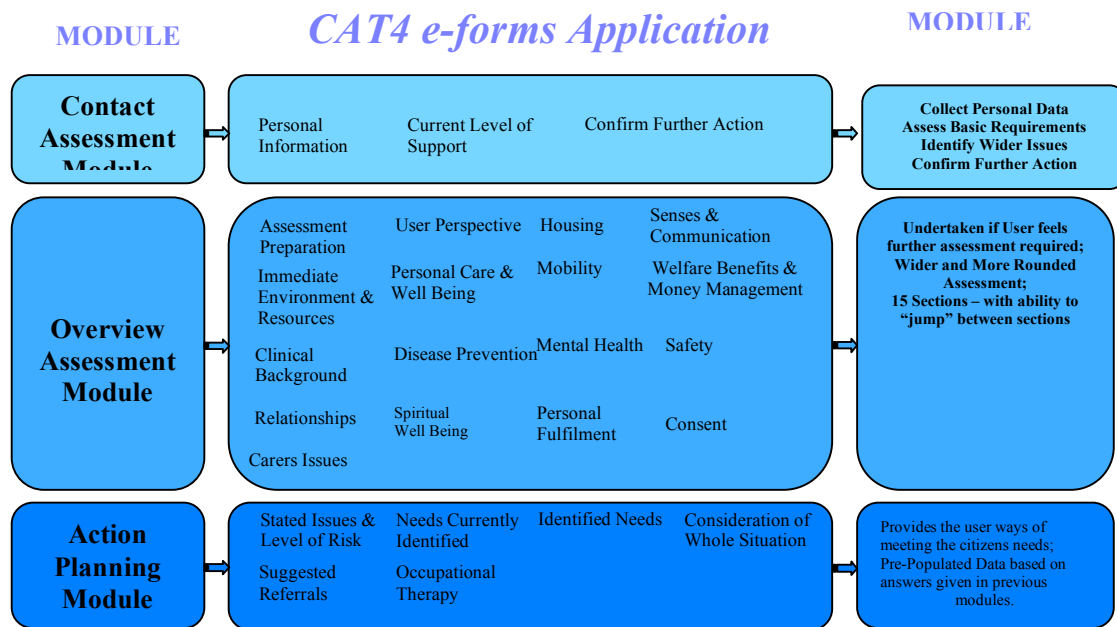


Figure 4.1 Overview of single assessment process

In the single assessment process, a range of different professional services staff from multiple agencies could potentially gain access and use the information of a single citizen, subject to data protection legislation. The input for data collection could be keyed in directly from a mobile device, PC or terminal, and images on paper can be scanned.

From Figure 4.1 it can be seen that there are three distinct phases: contact assessment module; overview assessment module; and action planning module. There are numerous options regarding how the assessment process is carried out, depending on the needs of the person as judged by the professional assessor. An important part of the software is to validate data at the point of capture and pre-populate data fields with data from an earlier part of the form or from other systems where this appropriate. It also enables the flow of data and decisions from the single assessment form to go directly to the relevant agencies and associated systems so that there are no time delays because of the manual flow of data from one system to another one. The 3G card extends the functionality of the single assessment solution by enabling the data to be transmitted immediately at the point of capture and the person being assessed can see that their case has been processed, and that requests for actions or decision from other individuals and agencies have been sent electronically.

4.2. Citizen Advice Bureau

Citizens Advice Bureau (CAB) is an independent, free, impartial and confidential advice service. The CAB provides advice on welfare benefits, consumer, debt, housing, immigration and legal issues. The CAB takes a holistic approach to advice delivery and all CAB staff are trained to deliver advice in all of these areas. This avoids clients having to go from one adviser to another to obtain advice in different categories of law. The advisers therefore need access to a broad range of information sources. The advice is delivered at CAB offices where the information to support the service is stored locally at the walk-in service centres. Such centres operate much like a local library whereby information and knowledge can be found through leaflets, kiosks and the on-hand advisers.

When operating from the main offices the advisers have access to a vast amount of information resources which includes the national CAB information system. In conjunction with the main office locations, advice providers were extremely conscious that certain groups in the community were unable to access these 'high street' advice services. People with childcare responsibilities, carers, the elderly and those with disabilities can all find it difficult to physically get to an advice agency and wait to be seen. The solution was to target the advice service at these groups and take the service to them. Appointments are now arranged for clients to be seen at advice sessions delivered at children's centres, community centres, health centres as well as home visits.

Prior to any discussions of 3G technology, the ongoing challenge for Outreach Workers was to deliver the same information and knowledge that is available in the high street locations. Given the wealth of information held by CAB it is unrealistic to expect outreach workers to keep abreast of all the movements in legislation, administrative procedures, and new service initiatives. However, the critical goal of an Outreach Worker is to deliver timely, accurate and reliable information. A clear gap between actuality and ambition.

However, the opportunity to significantly lessen this gap lay within the potential of 3G technology. CAB expected 3G technology to enable the outreach worker to unlock timely information, legislation and resources from the web-sites of interrelated agencies. The importance of this cannot be understated. By simply accessing a trusted source, the Outreach Worker has full confidence in the service they are delivering to the citizen. This benefits both the clients experience of the service and also the Outreach Worker who is better protected in the eyes of the law.

"When delivering advice at outreach centres the adviser uses a laptop to access the CAB Info Systems. However it is also an advantage to have access to the internet in order to research and locate information relevant to a client's enquiry. Claim forms can also be downloaded and completed on-screen with a client, thus saving time. Previously advisers did not have access to the internet at outreach venues as no telephone access point is available. The 3G card provides the freedom to connect to the Internet at any outreach (session). Having instant access to the web allows CAB to offer a similar standard of service that you might find when walking into an actual high street office".

Outreach Worker, CAB.

Consequently the 3G technology brought about a strategic innovation through the introduction of a Distributed Case Management System. The system allows the Outreach Worker to access and update citizen case files including, name, service requested, history etc, all through the outreach technology. Such an innovation is potentially radical as it changes the client relationship. Rather than spending acres of time completing forms and deciphering the clients requirements, the information is accessible, allowing the Outreach Worker to offer a higher value service. Work does not need to be collected, processed at a convenient time in the office, and brought back to the client's attention. The data is there, so the session can

concentrate on case investigation, advice and resolution. Hence, the integration of 3G technology and Distributed Case Management System brings about enhanced service quality, more client visits, and overall lower administrative costs.

4.3. Manchester Advice

Manchester Advice (MA) offer legal advice to citizens covering a wide range of topics including debt, consumer, welfare, benefits, education, employment, community care, immigration and health matters. MA is the advice service provided by Manchester City Council. Like CAB, advisers have access to internally held records and forms, internet information and other relevant agencies.

One of the novel innovations being tested is to use an internet link to clients that utilises a web-based video-conferencing tool. This exploits the internet as a natural communication channel with citizens and allows new forms of interaction between the adviser and the client. The tool is otherwise known as ‘Communicate’ (www.mddacomunicate.com) and enables anyone who has the Flash Player installed in their web browser to take advantage of chat, whiteboard, video, audio, file sharing and real-time consultation tools.

Such an initiative would have a dramatic impact on the efficiencies of the service and also the customer experience. The mere costs of running home visits are considerable, not to mention the administrative overlay. The Communicate process is far more efficient allowing meetings to take place at any time of day without leaving the office – no transportation costs and no time wasted in transit.

The positioning of Communicate and its interaction with advisers and multiple agencies has been a key consideration throughout the development process. Where does the technology fit? How do clients interact with the system? How are the advisers distributed? Figure 4.2 depicts the role of Communicate from a client perspective. It is suggested that clients pass through five critical phases or layers in the system.

1. The client would search for an appropriate advice giving agency that can solve their problem or direct them to an appropriate solution. In this case we assume that the client accesses Manchester Advice.
2. As depicted, there are two traditional types of contact, walk-in advice office or contacting the service by telephone. More recently, Manchester Advice has constructed an advice giving website (www.advicekit.info). The website offers agency search, self-help information, features and updates, and information about volunteering and job opportunities. More significantly, this is the intended location of the Communicate tool; a significant change to the mode of interaction once seen. Once the user is logged onto the Communicate tool the system will offer a series of questions, most importantly Communicate needs to know the enquiry type or what service is required by the client? By asking such a simple question Communicate can offer an appropriate adviser. In some scenarios the client needs might be quite general, in which case it would be best to interact with a generalist adviser. In other scenarios the client needs might be more specialist, and it would be more effective to point to a specialist adviser such as law, benefits, housing etc. In essence, the Communicate tool brings together multiple agencies from a single client perspective.

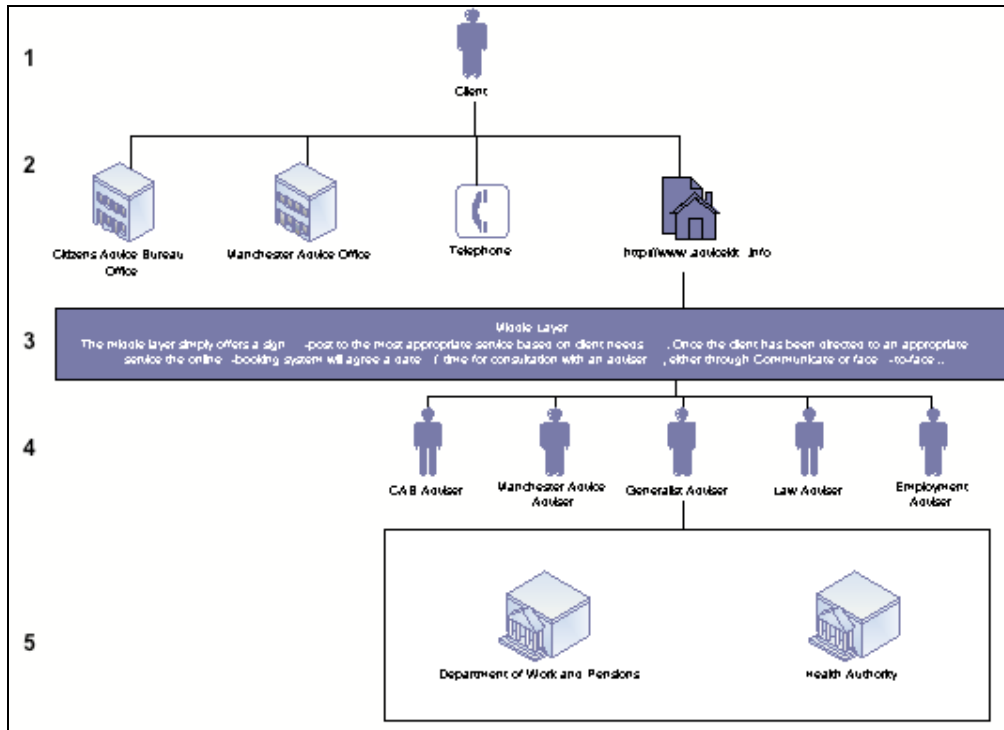


Figure 4.2 The role of 'Communicate' in the advice agency system

3. Once the client has been directed to an appropriate service an online booking system will propose a series of dates and times where a consultation might take place.
4. On the agreed date/ time the Communicate session will be enacted. The client and the adviser hold an online meeting using the video, audio, and text capabilities of the Communicate tool. The system has been constructed in a way that allows the session to operate within a client's browser and offers flexibility, through 3G technology, to the adviser who can log onto Communicate tool in any location.
5. The opportunity exists to integrate the Communicate system into wider public-sector authorities, for example a Primary Care Trust or the Department of Work and Pensions. This has not been fully investigated by CAB or Manchester Advice but the idea of transferring clients to wider specialisms is simplified through the use of information technology.

As well as operating the Communicate tool on a 'one adviser to one client basis' the vision is to disseminate broadcasts to registered audiences. These events would be advertised online through www.advicekit.info, covering topics from house buying to employment and consumer benefits. When a visitor accesses the site they will have the opportunity to register for the broadcast and be a part of the interactive session. Such local initiatives challenge the role of television broadcasters such as the BBC or SKY. Local services, advising on local needs, using new media and interactive technology could have a significant role to play in society.

The amalgamation of 3G technology, Communicate, and human expertise leads to significantly new models of service delivery. Citizens are now better informed at the point of contact. Portals such as that presented here can solve queries at the first point of contact and/ or correctly filter an enquiry to the appropriate agency. This lessens many of the frustrations evident in earlier government processes. Key to this case is the recognition that those agencies can now innovate and deliver much higher value service. Where face-to-face advice is required this can now be done through simple media technologies such as audio and video conferencing. The innovation lies in the ability of an outreach worker to undertake the sessions after say visiting a local community hall. They are not restricted to a set of pre-defined times. They are also in a

position to offer sessions on a one to many basis, rather than the common practice of one to one interaction. Expertise is delivered through new media, captured and, even, offered elsewhere. Such examples point to economies of information, citizen empowerment and an exemplar in the strategic implementation of new technology.

5. Conclusions

The review of business and academic literature on the topic of e-government identified five key themes. The importance of the themes was strongly supported by the case examples. Perhaps the most important theme was the need to have inter-operable systems, that is, systems that comprise multiple agencies working on common business processes and shared information technology infrastructures and software applications. The inter-operability applies to connecting different agencies and functions within a council, and also to connecting with suppliers and customers of e-government services. A good example here was the Formfill implementation of the single assessment process where a tablet PC was used to collect a comprehensive set of data from an elderly person and this was automatically linked to a range of back-office systems in different agencies. All elements of the overall system in terms of people, process, agencies and service delivery were connected. Similarly the CAB and Manchester Advice examples of using 3G to connect to information sources that would be simply too great to store locally enabled individual citizens to gain access to advice and information as if they were in a standard, fixed CAB office with all the associated office and technology infrastructure.

The use of business process modelling to gauge the implementation of the new technology in the context of other IT systems and business processes worked well in the CAB, Manchester Advice, and Formfill case examples because these organisations have managed to implement significant changes to the way that e-government services are organised and delivered. The research framework suggested that the impact of information technology on business has demonstrated that there is an interaction between the technology and the business strategy of the organisation. This suggests that 3G technology can be applied to either solve existing problems or create the opportunities to design new work practices and influence business strategy. The case examples support this claim, but there is significantly more evidence of strategic innovation than the simple improvement of current processes. Moving beyond one to one client consultations and into streaming (and downloadable) broadcasts suggests a significant step change in business visioning. It contradicts any notion that the public and voluntary sectors are marred by a technology aversion and a lack of willingness to innovate. Each case had an excellent understanding of government applications and was familiar with the use of IT.

In the case of Manchester Advice the service actors further proposed that each adviser might one day detach themselves from the physical locality of an advice office, moving interchangeably from client visits, to home working, to online interactions, and even e-learning through the Communicate technology. In this regard, they suggested, the role of an office may also change. It will become simply a place to offer walk-in services and perhaps also hot desk facilities. The office will become a place to interact with colleagues in group liaison meetings either in a physical or virtual space. Knowledge can now be passed and stories told through a variety of different mediums. Such ideas and innovations suggest that the inculcation of a new technology creates new possibilities regarding business process design, which as the literature suggests, influences the overall business strategy of the organization.

It is also clear that introducing 3G in isolation from other improvements to systems and processes will lead to gains for the individual but not for the organisation. Multiple innovations appear to leverage each other in the implementation process. The most successful examples achieved alignment between multiple factors including business strategy and information and communication systems (including 3G). The application of 3G technology for individual use has become almost routine now and the opportunities lie in understanding how to implement it successfully in an organisational context.

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