The Application of Methodologies in e-Government

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Abstract: This paper contributes to critical discussion on the contribution of methodologies in implementing e-Government programmes. The paper takes into account institutional, technological and organisational factors within the public sector and how the concept and practicality of methodologies are being applied. The paper explores the experiences of e-Government specific methodologies, and in drawing on the work of Wastell, Newman and Kawalek (2002) to illustrate perceptions of e-Government by implementing agencies.

Keywords:- e-Government, methodology, IT enabled change, pathfinder

1. Introduction

Through the early 1990s as Internet technologies rapidly matured and found increasingly commercial applications, the public sector began to increasingly invest in service based applications such as Customer Relationship Management (CRM). Following the return of a new administration in the United Kingdom in 1997, Information Systems Technology (IST) began to take prominence as a means of enabling public sector reform across local and central government institutions in the U.K. (known as Modernising Government or e-Government).

An ambitious programme was announced - given the scale and delivery target of 2005, what use has been made, and value taken, of modelling or methodology techniques in terms of delivering such a diverse set of change and technology?

The staged and manageable introduction of technology and change has been facilitated by recognised techniques for some time, and have been applied with mixed results across a range of projects in both public and private sectors. There are two perspectives that may allow for an examination of e-Government in terms of these techniques:

1. What techniques, models and methodologies are currently at the disposal of public bodies responsible for overseeing e-Government implementations;
2. Assessing e-Government programmes and extent of techniques applied.

These perspectives are considered through a specific example of an e-Government programme as a case study and illustrate the extent to which models or methodologies have supported it. The case study provides an overview of the decision process of a specific organisation in the manner of implementing e-Government, in contrast to discussion of e-Government in broader policy terms.

Also, a tentative reference is made to a supportive methodological tool for diffusion of the practicalities of such a policy within an organisation.

2. Government motivation

Modernising Government is the formal policy name allocated by the U.K. government to the process of introducing e-Government into the public sector agencies and organisations at both central and local level. A more formalised definition is presented by Becker et al (2004) in that electronic government entails the simplification and implementation of information, communication and transaction processes, in order to achieve, by means of information and communication technology, an administrative service, within and between authorities and, likewise, between authorities and private individuals or companies.

All public bodies are involved, in varying degrees, with the implementation of the Modernising Government agenda and the technologies and disciplines required. The nature of models and methodologies historically associated with IST projects are subsequently discussed, but the UK has introduced models for e-Government implementation, known as Pathfinder projects.

Pathfinders have been introduced with a similar view to providing best practice, but

apply to complex, unusual or significantly different areas of service delivery acting:

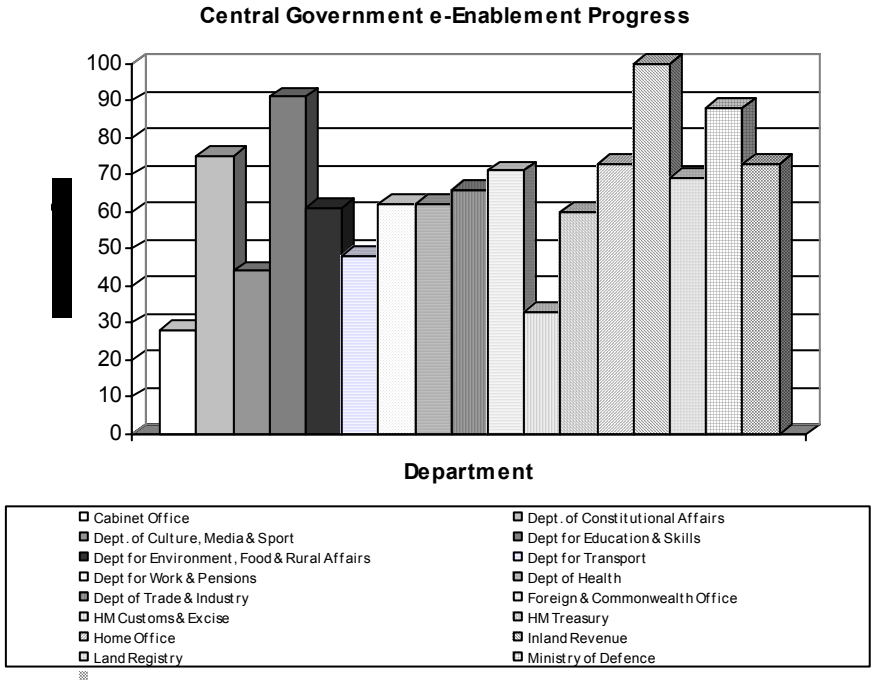
- As a focus for learning to enable all councils to meet the 2005 Electronic Service Delivery (ESD) target hence the balance by region and type of councils;
- To enable those councils at the leading edge to further develop products and disseminate their learning and good practice more widely;
- To develop products for national roll out, whether by local councils themselves or with private sector partners.

3. Funding and monitoring

Central Government in the U.K. allocated responsibility for electronic local service delivery to the Office of the Deputy Prime Minister (ODPM). Funding and organisation is headed by the e-Envoy, a public official charged with monitoring the progress of the public sector toward an agreed level of ESD delivery across UK public sector organisations.

Organisations are required to notify the e-Envoy of progress through formal reports, Implementing Electronic Government (IEG) statements. Where progress is deemed to be acceptable, funding is granted in order to support further progress in e-Government. The granting of the fourth round of funding is currently underway. Each review is based on a theme: the current round is to be based on the progress organisations are making with regard to joined-up working with other organisations.

The quarterly report of March 2004 from the e-Envoy documents the progress of central government departments in meeting the target of 100% of transactions available electronically by 2005. The figure below illustrates notified progress up to January 2004 of overall progress towards ESD based on these quarterly reports.



4. An established e-Government context

The changing nature of public services is certainly not new, and certainly not unique to the U.K. The broader landscape of e-Government has seen public sector organisations in the developed states of Europe, Asia and the Americas at differing stages of implementing joined-up services. What has been their scope? Can they be described as successes? Is it realistic to assess and contrast the projects and the techniques used to implement the e-Government concept with those applied in the U.K.?

In 1959, the Association for Computing Machinery (ACM) was contemplating the progress of automated data processing (ADP) across the machinery of the U.S. Federal Government. The third and final paper noted that 'progress in developing and installing electronic systems varied considerably between installations'. A number of the issues that were identified in the paper reflected obstacles still occurring in IT projects today, including underestimating risk, time and the planning required.

4.1 Comparative evaluation

The United States has continued e-Government implementation from 1995, where a mere 8.7% of local governments had sites on the World Wide Web. This was projected to increase in 2002 where e-Government offerings will have reached or exceeded 90 percent. As a further indication of the growing significance of e-Government, the Gartner Group projected that all levels of government in the US will increase spending on e-Government from $1.5 billion in 2000 to $6.2 billion in 2006.

The phases of progress in the US in terms of e-Government have been observed by Holden, Norris and Fletcher (2002) as being:

1. catalogue;
2. transaction;
3. vertical integration;
4. horizontal integration.

In order to provide an increasingly mature and sophisticated level of service, each phase has to be passed through in order to progress. They note the dearth of information and contemporary literature on e-Government, including both surveys and case studies.

Their research did show that larger urban or industrial centers were more likely to adopt new technology. In addition, according to the local government respondents, the five greatest barriers to the adoption of e-Government, in order of frequency of response, were:

- lack of technology or web staff;
- lack of financial resources;
- lack of technology or web expertise;
- issues regarding security;
- the need to upgrade existing information technology.

Other nations were polled in 2002 for the second year running by consulting group Accenture. The group of 23 nations were assessed based on 169 national government services across nine major service sectors being investigated. As a subset of the previously mentioned five phases, services were categorized into three levels:

1. Publish;
2. Interact;
3. Transact.

These levels were intended to reflect the maximum maturity at which a particular service could be offered. Canada, Singapore and the US were deemed to have attained the highest maturity level provided for by the survey.

The international aspect of the efforts to provide e-Government programmes provides a fruitful areas for comparisons – of approaches, perceived benefits or otherwise, use of technology, investment and commitment and success. The UK was placed by the Accenture report in the second grouping of nations implementing e-Government. A second parallel lies in the barriers identified earlier by Holden et al to implementing e-Government.

5. Modelling and methodologies

The introduction of new technologies or working practices within an organisational context are primarily enabled by disciplines or techniques such as project and programme management, change, technology transfer and business reengineering. The scale of an undertaking may determine the relevance of applying some or all of these techniques in practice, but a pragmatic blend of these is often required in many instances.

Given the nature of an e-Government implementation, all of the above are applicable given the scale of the undertaking. Models and methodologies provide a route to promoting consistency and other aspects of best practice, and it is appropriate to note the relationship between successful projects and the measured application of such tools and techniques.

Over the past forty years, the emergence of 'hard' and 'soft' schools of systems thinking have shaped perceptions of approaches to the implementation of IST within organisations. The decisions taken in pursuit of objectives, definition of

functional groups such as production, financial and marketing systems and the clear categorisation have lead to engineering of the subsystems to optimise each.

Established methodologies apply a logical series of steps to analyse and redesign or rearrange the features of the subsystem, for example Boehm's description of (and later Sommerville (2000)) waterfall (and later spiral) approaches. Examples of commercial or proprietary methods include Structured Systems Analysis and Design Method (SSADM), advocating a documented process to investigate, assess and reengineer an identified system or process. PRINCE 2 enables formalised control and oversight of an agreed project.

The boundaries of procedural methods have been contrasted to a more holistic and integrated approach advocated by Checkland (1990). Factors noted by Bailey (1993) that would fall under such a more inclusive approach to introducing technologically linked change might include:

- Strategic planning
- Organisation structures;
- Existing procedures and systems;
- Skill levels and existing training and development programmes;
- Cultural makeup;
- Accepted means of introducing new technologies;
- Design methods and project management;
- Project team membership;
- External relationships.

With an increasing level of complexity in organisational life, Checkland (1999) continued to investigate the focus of broadening the inquiry into management where harder systems engineering techniques discovered limits and boundaries to their applicability. One drawback with a waterfall type approach is illustrated through the very objectives of a project utilising such a method – 'short circuiting' the steps in search of a reengineered system.

Pardo and Scholl (2002) presented an illustration of this with an action research project , where short circuits to failure in a large project were identified and addressed in a live project, the New York State Central Accounting System Redesign Project. Management pressures came into play and the project risked failure through subsequently trying to take the identified 'short cuts' to project delivery.

To avoid such factors influencing the outcome of an e-Government programme, the adoption of a suitable methodology in support of delivering the Modernising Government agenda therefore has to take into account such factors. This can be through introducing a combination of change and technology at a varying number of levels both internally and externally. A positive contribution can be made through the methodology being selected on the basis of it reflecting the culture of the organisation to both its members and the communities it does business with, collaborates with and serves.

5.1 Modelling and methodologies toward e-Government

The statutory activities and responsibilities that public sector organisations support through use of documented procedures and IST are consistent across the UK. Organisations in the public sector have a mixed record of using methodologies in introducing IST for new or replacement systems.

As mentioned previously, use of the Pathfinder projects has been made to provide consistent 'blueprints' for organisations undertaking projects which inherently address the same core requirements. These blueprints support all the activities involved in the development, deployment and continued operation of an IST project, which are all candidates for management through a relevant technique.

The Government may have recognised a shortcoming of available methods. The combination of factors that sets e-Government apart (including change, new technologies, process re-engineering and so on), may not be perceived as particularly onerous within a single project. However, the circumstances and scale multiply the complexity and brings into question the applicability and support offered by existing methods.

One of the Pathfinder projects, intended to address new or complex areas of the e-Government agenda was the Salford Process Reengineering method Involving New Technology (SPRINT). The new methodology was designed to introduce programmes involving the level of complexity and risk presented by the implementation of e-Government.

Currently, only a limited number of public agencies have formally adopted SPRINT for their e-Government programmes. Influential bodies, for example Manchester City Council, have stated their intention to assess and implement the methodology to support their investment in e-Government and the related change process. Current empirical evidence and fieldwork has suggested that the use of existing methods and particularly project management (notably Prince 2) are being employed to control the implementation of e-Government within the public sector.

There is a clear if potted genealogy for the techniques used to specifically deliver e-Government in the U.K. and elsewhere. The application (or otherwise) of appropriate techniques and a reliance on control methods has really only served to throw into sharp relief the gap between established thinking and practice compared to new situations and circumstances arising from the change in systems and practice driven by Internet technologies and e-Government generally.

6. An e-Government case study

The scope of public sector agencies involved in e-Government activity is all-encompassing in the U.K. The class of agency identified were Metropolitan Borough Councils, presiding over predominantly urban environments, many providing key services including housing, education, social services, environmental services and transport. Demographically, populations and densities are comparable and the nature of the urban environment provides infrastructure more conducive to e-Government technologies and related service takeup in both the civic and business communities.

The premise for the case study was to provide an insight into usage of Information Systems methods, and the results of their usage in the e-Government context. The Metropolitan Borough Councils will represent this sector, due to the level of IS usage and likely levels of change.

The key factors that have a bearing on the successful introduction of Modernising Government principles within a target organisation were examined. This took the form of initially recording the anticipated approach and assessing the likelihood of success.

The execution was monitored on a regular basis. At the close, a comparison of results and progress will be undertaken to measure the success of introducing e-Government against initial plans. The amendments, issues and factors having a bearing on the level of success are noted and taken into account.

6.1 The executive strand

Each strand of local government (elected and permanent) has particular characteristics and drivers and contribute to service delivery and focus. The Executive was to be assessed in order to appreciate a specific delivery perspective in terms of decisions, goals and definitions of service. The permanent officials perform implementation of policy, and a generic organisation chart is presented in Figure 1.

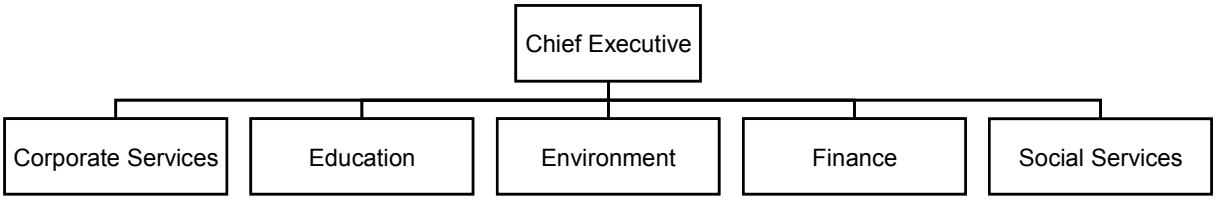


Figure 1 - Metropolitan Borough Council Advisory Structure Chart.

Council officials are tasked with implementing local Council policy in addition to central government directives and regulations. They will be designing,

planning and implementing projects and activities based around the Modernising Government agenda. In addition to advising elected Members, they will be budgeting and preparing for medium to long term changes in organisational and operational ways of working.

6.2 Key areas

In terms of introducing a major upheaval in terms of the focus and activities, the following topic headings were used to work with participants:

- Strategic direction
- Drivers for change
- Models for change
- Methodologies applied
- Approach to education
- Preparing people
- Key projects
- Programme/project structure
- Anticipated outcomes
- Measures of success
- Ongoing performance measures
- Anticipated issues
- Dealing with issues

6.3 Agency profile

Council A is a traditionally coal mining and industrial area and the decline in these industries led to high unemployment in the 1980's and early 1990's. It's landscape also suffered from its industrial heritage with 622 hectares of land being designated as derelict in the 1993 Derelict Land Survey. Even now Council A is a highly deprived area with 15% of its population of 311,000 living in wards which are in the most deprived 10% in England. On this measure Council A is in top 60 of the most deprived districts in England.

6.4 Local situation

The responsibilities for e-Government in Council A lay with a small executive committee consisting of members of the Senior Management Team. Interviews were organised with the members of the committee, who were: the Head of IT Services, the Director of Finance and IT, the Deputy Director of Human Resources and the Head of Strategic Planning. The subheadings below provide a selection of the key areas explored in the course of the case study.

6.5 Organisational aspects

The majority of Directors were approaching retirement at the time of the sessions. Deputies have not been in place for some time, and the contributors perceived that this is an opportunity for change in a number of areas.

6.6 Methodologies

The ethos at Council C regarding projects, IST project in particular, is 'evolution not revolution'. Technology implementation is based around assessment of a pilot phase, whereby specific objectives are set and successful attainment of the pilot objectives moves a project into a further phase. Figure 2, Council A Phasing, illustrates the progression of pilots from exploratory phase to established implementation project.

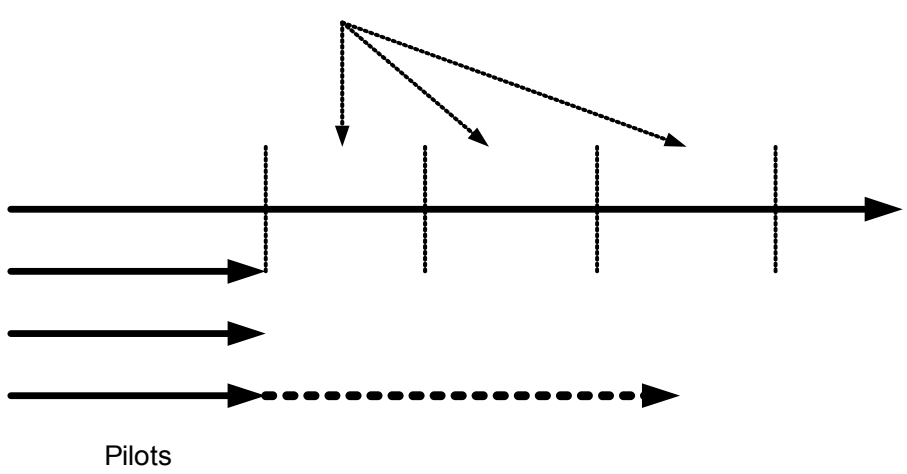


Figure 2 -Council A Phasing

The discarding of a pilot leads to a search for a replacement: final business objectives are delayed not ignored. The methodology broadly reflects a 'waterfall' approach but is more of a 'house style' than a formalised and auditable means of implementing extensive IST programmes.

An example cited was the introduction of electronic forms as a technology and business processes. Council A investigated the experiences of neighbouring Authorities regarding their experiences in this field which indicated an typical implementation period of one month. The piloting approach, successfully applied by Council A was used in their electronic forms project. A single department was involved in the process for initial design to implementation. Feedback from the staff was incorporated and subsequently the pilot was introduced Council wide over eighteen months. The implementation may have been swifter but this is not the culture of the organisation.

6.7 IS strategy and e-Government

Early in 2002, following extensive discussions with the departments, a new IS Strategy was issued. This centred around a replacement timetable for the legacy Council systems based on three main drivers, being:

- Basing system replacement around business processes and the capability for redesign;
- Technology linking front and back office systems increasingly enabling self service;
- Recording of transaction progress for performance assessment.

This movement of assessment to being a key component of Council systems is presented in Figure 3, New Auditing Paths.

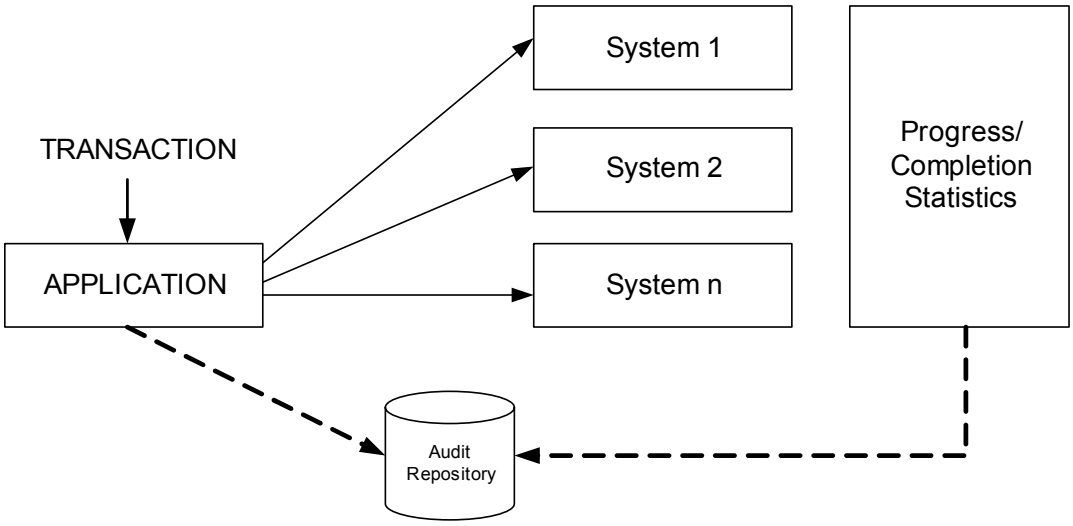


Figure 3 - New Auditing Paths

The e-Government initiative has resulted in a number of existing local bodies and new partnerships being allocated funds, without necessarily a clear remit on how these monies are to be best allocated. The experience of Council A, as a member of many of these local and/or regional groups, was the precedence of policy making over activity. The duplication of projects elsewhere was common given the lack of experience or direction in facilitating the bodies to deliver benefits.

6.8 Change

The executive committee referred to previously has responsibilities beyond e-Government. Where an initiative is deemed key to the Council achieving strategic or key objectives, resources and be suborned promptly given that the majority of changes are associated with the four Directorates represented on the committee.

The approach to change within Council A in terms of inclusion and empowerment combined with technology and changing

circumstances is illustrated through the ramifications of introducing a new cash receipting system across the Borough.

The project originally entailed closure of cash offices across the Borough, but the need for this was disputed by officers and members (which brought political interests and pressures to bear). A review was initiated by the committee, which discovered an impact analysis had not been made regarding the closures.

Service demands were for longer hours and Saturday opening. Subsequently, services were made available from libraries and through an innovative relationship where Council service users could access PayPoint facilities in Co-Operative retail stores and Post Offices. Service access was improved in conjunction with savings of over £350,000 from selective office or counter closures.

6.9 Technology transfer

Council A are unsure of their progress in regard to their peers and the overall government timetable. Comparitors are not perceived as helpful or informative, including the Society for IT Managers (SOCITM) reports on e-Government.

No formal strategy exists in Council A in terms of technology transfer to staff or citizens: the adoption of new technologies apparently just happening. Web site usage statistics are increasing daily, and conversely telephone channel contacts are increasing.

Significantly, technology projects are progressing on an ad hoc basis with poor regard to relevant circumstances and factors. For example, higher demand Libraries are to have staff trained and systems installed to allow processing of benefits claims: signoff/ approval and verification capabilities at convenient and local locations. This appears to be a positive contribution to the e-Government ethos, improving service through technology and revised business processes.

However, the creation of an independent trust to operate leisure services meant staff were to be transferred over to the new organisation under Government TUPE terms and as such would not be deemed eligible under Government legislation to undertake verification activities at that time.

6.10 Technology

Council A, as previously referred to, published a revised IS Strategy early 2002. This included appraisal of a number of initiatives undertaken by other Authorities, notably Beacon Councils.

In terms of electronic service delivery, Council A determined that it was not prepared for the foundation of introducing technologies. The lead committee was undecided over the appointment of a Service Delivery Manager to oversee such delivery. At that time, the examples they had witnessed did not reflect their circumstances enough to warrant an immediate programme of radical IST led change.

6.11 Assessment

The case study with Council A illustrated that although a central government agenda addressing a broad spectrum of public agencies is in place, the potential benefits that can be drawn from such a deceptively complex initiative need to be assured through the judicious use of meaningful parameters and/or directives. This type of agenda requires commitment through adequate resourcing and monitoring on the part of central government for the directive to be successfully implemented.

The Modernising Agenda sought to provide higher delivery quality across public services: the ability to work in a joined-up manner. This includes consistency of method, technology and application, and the case study of Council A highlighted a number of points.

Interpretation – Council A exhibited a flexible interpretation of scope and timelines in common with numerous public agencies. In discussing this interpretation, Wastell et al (2002) have observed the focus on service applies not only to the type and nature of e-Government implementations, but also to the essential drivers of local government including the democratic process.

Focus – The IS Strategy clearly emphasised a replacement and upgrade approach. There was no focus on service

improvements for service users or improvements to internal mechanisms through a measured programme of change. This approach has characterised other e-Government projects, i.e. projects instigated in isolation, projects being implemented on a minimalist basis to meet central government imposed targets, poor justification and limited or no joint agency approach to projects.

Recent tendering through central government contract agencies has indicated that significant numbers of agencies are only just commencing procurement of systems that are core to e-Government principles. Given the well-publicised Modernising Government timetable and targets, such activity does not bode well for clear and rational decisions, and reinforces the use of project management as a tool in systems design and integration.

Service Users – Council A has noted an increase in takeup of Internet based services, also of more established telephone services. This has come as a surprise, but consistent with a narrow and limited approach to designing and planning, which would usually involve anticipating outcomes and wider results of projects that cross functional and operational boundaries.

Aggregation – Council A closely assesses technologies as part of a project, which in other circumstances would be quite appropriate. The use of Pathfinder projects was designed to bring a consistency of solution and method, but their purpose of indicating best practice has not been adopted at Council A or neighbouring peer authorities. The independence of local government in funding and implementing IST systems has allowed a plethora of technologies and to a lesser extent standards to proliferate based on a parochial view that proven national solutions do not apply to local needs.

Shared Approach – Council A promotes partnership working, intended to ensure a complimentary and joined up approach in delivering comprehensive and sustainable improvements within an area. This has worked well in a project with emergency services for a specific business process where issues around information management and sharing were not involved.

7. Conclusions

As a result of preparing the paper, the primary concern involved both the relevance and availability of methodologies and techniques suited to the implementation of e-Government. The development of Information Systems has provided a range of proven methods and tools to support agencies in their efforts in this area (notably SSADM and Prince2 for systems design, implementation and project control respectively). The appropriate and documented application of these techniques has contributed to the quality and success of many IST project implementations.

This is supported by the case study presented in the paper, in addition to the wide and diverse nature of e-Government programmes on a more international scale.

However, there are two specific issues that require highlighting. The first concerns the manner in which established techniques and methods are being applied in terms of focussing on the issues central to e-Government and its implementation. The case study indicated the treatment of e-Government as a project implementation, consisting of infrastructure, equipment and software. Current fieldwork and strong anecdotal evidence indicates that this approach is endemic across UK e-Government programmes.

Vassilakis et al (2003) commented on this in an assessment of electronic forms implementation by the Greek government, commenting on the development of electronic services was being treated as an isolated software project, thus information extracted from the involved domain experts is recorded as low level ‘user requirements’, rather than as high level organisational knowledge.

This supports the thinking of Wastell et al (2002) who assessed the selective emphasis placed by implementing authorities on improving service than addressing more complex issues around local government that e-Government raises, including access to democracy and

policy making. This strategy, albeit unwittingly perhaps, of shifting the focus of the e-Government effort removes the emphasis on change and evolvement of government services from the delivery level upwards.

Secondly, the focus movs to the nature of methodologies. Previously, we have seen how existing models and methodologies provide a rich seam of support for organisations contemplating a major IST programme of a similar scale to e-Government initiatives. These have been utilised to good effect in many instances, especially internationally.

The new and unique nature of the e-Government domain has begun to cast a shadow on the values of existing IST models and methodologies in this nascent environment. Becker et al (2004) discusses the value of existing process oriented techniques leading to modernisation, contrasting to the reducing value of systems models in the face of rapid technology change and information privacy and usage issues.

This does not make good news for current and potential implementers of e-Government. The SPRINT approach, addressing introduction of new technology into an organisation, may provide a potential route for new methodologies to be developed. This growing emphasis on standards in a rapidly changing environment in order to ensure interoperability presents a potential shift in IS design. This shift indicates a more technological approach, as opposed to a more user centric view that was discussed by Moen and McClure (1994).

The previous successful application of methodologies for implementation of e-Government has coincided with a clear national framework firmly supported by the national government concerned. These frameworks have specified specific targets, incorporated the change, service and democratic issues at their heart and been nationally co-ordinated and well funded.

The issues surrounding implementation of e-Government in the UK has occurred not to a lack of supportive tools and techniques, but to a combination of lack of firm direction and steerage from central government. The nature of e-Government funding rounds (IEG) has been to develop a differing theme or focus in each annual round, requiring tactical shifts in e-Government implementations to cope with each IEG application. The funding available is not necessarily adequate to implement the IEG round requirements in full. These factors, tied to a local dilution of policy have resulted in e-Government programmes becoming IT projects as opposed to change agents.

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