European electronic service infrastructure building - drifting into the future?

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ABSTRACT

Delivery of electronic services requires a service infrastructure including organisational solutions for logistics and client-organisation interactions. We report a study covering three years of efforts by nine cities in eight European countries in developing such solutions.

We found twelve distinct "crises", situations where goals, environment, and actors changed, and the process was found in a stage of improvisation. The overall process was largely unstructured and improvised. Stabilising factors were central government policies (national, EU), the general technical development, and market demands.

The Web was in practice a "cuckoo in the nest", intruding in ever more activities and introducing unexpected new demands. Web projects were seen as technical projects; more important success factors pertaining to users and organisation were largely neglected. There was typically an infrastructure link missing, a body competent of managing the whole process of bundling services from different service providers.

INTRODUCTION

Many local and regional governments have followed companies in setting up Web information systems (WIS). The purposes are often boldly stated and cover economic, social, and democratic ambitions:

"The public administration shall use IT for making *more effective operations* and providing good service to companies and citizens. More *rational work routines*, more *effective organisation* and *co-operation in the public agencies* shall *improve services* and at the same time *reduce costs*. [……] IT shall be employed to *develop contacts and interplay* among the public, businesses and the public administration. Citizens' and businesses' public sector *contacts* shall be made *simpler* and more *open*". (Gov. Bill No 1995/96:125; Toppledarforum, 1998. My italicisation and translation)

Such goals are inscribed in central government IT strategies in many countries. At the local level, however, strategies are often lacking, or outdated (Håkansson, 1996; Hansson & Johansson, 1997). This is a problem, because much of the development is in the hands of local authorities.

What happens during the process of developing electronic services; what hurdles are there, and how to get past those?

Case stories abound (IDPM, 1998), but they usually only describe ongoing projects with little analysis or comparison. Research typically falls into one of two categories: (1) exploratory sites working under non-typical conditions (i.e. Virginia Tech, 1998, Tsagarousianou et al, 1998). In such cases, special conditions typically make results less general; extraordinary resources, subsidies to providers and/or users, special user populations, etc. (2) single special issues of a technical character are covered; fraud prevention, integrity of data in electronic document exchange, public access to official records, etc.

While important, such studies give only fragmentary insights. What about comprehensive strategies for using IT for achieving the bold purposes? At the end of the day, governments must find ways of relating to WIS as a strategic medium. How can development methods be found, that is, how can early experiences be shared, evaluated, related to societal goals, and debated so as to make the transition of services into the electronic medium smooth? It seems the development so far happens much ad hoc (Greeves, 1998). Strategy documents of the kind cited above abound, but

knowledge about implementation beyond things like guidelines for home page design are largely lacking.

For a city to provide services electronically is a much more complex task than it is for a company, as it encompasses a wide variety of activities and includes elements of democracy and exertion of authority as well as economic goals.

We report an attempt to examine the hurdles to successful use of the electronic medium in a local government setting.

INFRASTRUCTURE DEVELOPMENT; "IMPLEMENTATION", "DRIFTING", OR WHAT?

Many see technology deployment in an organisation as a rather straightforward matter of "implementing decisions" (Broadbent & Waill, 1997). From that point of departure, the problem concerns how to make things happen the way they were intended to; decisions must be "kept alive" Latour (1996, p 86). Ciborra (1997), on the other hand, claims that technology "drifts"; during the "implementation", numerous decisions are made, by many actors, that make the original "grand plan" obsolete. New appropriations of the technology are made along the road, which makes the outcome considerably different from the intended, even "almost out of anybody's control" (ibid, p 76). Others claim that these reappropriations are in fact not free and unpredictable, but are structured by the "ongoing effort to keep the (gradually metamorphosed) infrastructure alive" (Monteiro & Hepsö, 1998, p 270).

Given this spectrum of views, we are here concerned with how cities made the central governments' grand plans happen.

METHOD

This paper summarises a three-year (1996-1999) empirical study of nine European cities in eight countries developing telematic services within the Infosond project (EU contract UR 1017). The empirical material is presented in more detail in Grönlund, 1998; Grönlund & Forsgren, 1999; and Grönlund 2000.

A large number of cases were collected. Project leaders in the nine cities were interviewed at their bimonthly meetings. We did a usability study of selected systems in 1997 (Grönlund, 1997) and studies of use, management, and economic evaluation in 1998 (Schijvenaars, 1998). Further materials were project reports, minutes from meetings, and documents from the cities, like infrastructure plans and regulations.

In spring of 1998 a group including researchers and people from the cities reviewed the development process and analyses led to the "dozen crises model", briefly presented below.

Over the following six months the material was further analysed. On three occasions, the report was presented to a wider audience of project leaders in the cities; the model, the description of the crises, and the use of the cases. This was done to ensure people understood our model and agreed with our interpretations, and that we had used their cases appropriately.

DUE PROCESS AND "THE DOZEN CRISES MODEL"

According to Actor-Network Theory (ANT), the creation of *facts* comes about during processes of negotiation among *actants* (human or non-human actors). Facts are not found, they are introduced into a social context as *claims*, which are translated by enrolment and inscriptions of networks of actants. A growing network of actants are involved as claims get strengthened and weakened (McMaster, Vidgen, & Wastell, 1999). Actants are heterogeneous; the strength of the network relies on the strength of the actors' aligned interests.

Due process is the process by which a claim gains support or gets excluded. Introduction of a claim brings *perplexity* to the network (or organisation) where it is introduced. Follows a period of *consultation* where the claim is considered by the actors in view of other claims and existing facts. On the agenda is the claim's place in the *hierarchy* of things. If accepted, the claim becomes institutionalised; a *fact*. If not accepted, it gets rejected; in order to be reconsidered it will have to go through the due process once again (McMaster, et al, 1999).

Although networks evolve constantly, it is feasible for the purpose of making the process visible to focus on certain instances in the development. *Freeze frames* represent *inscriptions* of a technology in a particular moment.

The "crises" represent the "freeze frames" of the development we saw. Each of them represents a completed step in the development in terms of activities and goals in the cities. In that way they represent stable networks (shared views of the technology). Seen in a larger perspective, they were only steps towards the goal of proficient electronic management.

"Stability" means that people in the organisation felt a problem encountered was solved. It usually was, but because challenges ahead were not foreseen, the solutions often contained a seed to problems during the next stage of development.

FINDINGS

We identified the following 12 "crises" (unforeseen situations requiring profound changes) on the road towards proficient electronic service management:

1: "Start-up….of what?" (Initial motivations differ from final)
2: "Thousands of pages….." (Institutionalisation of production)
3: Messy appearance (Graphical design, Web organisation)
4: Parallel systems (How to phase out old routines?)
5: Choice of future technical platform
6: Cross-departmental integration of data resources
7: Staff motivation
8: Poor usability
9: Where is the payoff? (How to measure costs and benefits?)
10: From monopoly to service provider (Organisation faces a role change)
11: Where are the users? ("There is not much use yet – when will it come"?)
12: "Administrative tribal struggles" (social groups feel their domains intruded upon)

In the following, we briefly describe the nature of the crises; the main actors and the main conflicts. We exclude crises 7, 8, and 9, which are not so interesting in terms of actors and networks.

Crisis 1: Start-up….of what?

Cities enter the Internet largely because others are there.

Goals are specified, but are usually short term and, at best, only remotely related to better services or more efficient logistics. Examples of early goals include providing jobs to unemployed (creating Web pages), establishing a Web presence, keeping up with others, etc.

Systems are typically initially set up by some enthusiast(s) and funded by project money, which means they do not automatically outlive the project. If a project is successful, there appears a need to integrate it in other IT and organisational projects going on. This typically does not happen easily.

As a consequence of the lack of goals, it is hard to focus and provide good contents. A typical Web project starts off with the Chief Information Officer (CIO) in the organisation publishing things like the company brochure on the Web. (S)he does that alone with technical support from someone; a consultant, a project group rallied up from a local university media education programme or from a programme for unemployed, or from the computer department.

Only after this is done, the debate on the purpose of the Web system. Why should we be on the Web? The CIO comes up with a number of reasons, typically requiring organisational change at business departments. At this point, it becomes clear to several people in the organisation that the Web system will cost, if they go along with the CIO's suggestions. So they begin asking why they should.

In this phase, there is just a small group of actors. Legitimacy of the project is found in places at best vaguely related to the overall goal (not yet formulated). People who are needed to formulate such an overall goal are typically not involved, or are involved in a way that in effect conceals that goal. Thus, success or failure of the project is at this stage measured against the "wrong" goals.

Crisis 2: Thousands of pages…..institutionalisation of Web production

Once a Web site is established, there is typically no special budget allocated to further Web related work. The task of maintaining all the pages quickly overwhelms the small team of active staff. As a result, the task of overseeing the accuracy of the information is delegated to the business departments.

Additional problems are that Web technology changes, which means systems have to be redesigned and demands for information and services increase. Appears a need for automation and integration with existing systems.

Production may be a centralised or distributed. There is a need both for delegation of work and co-ordination, but the decision on which way to go can typically not be decided freely. There are traditions, and there may be changes of direction ensuing from political decisions that entail some actions and prohibit other.

At this stage, tradition typically conquers innovation. We see a number of actors entering the scene; local entrepreneurs promoting departmental interests, central bureaucrats and politicians striving for control, and technical consultants promoting their products, which have different focuses and overlapping scope. There is typically not yet a network of people in the organisation with the goal of "proficient electronic services management", but there are several networks with departmental interests. These now engage in discussions on how to "share the burden" of production of the new services. Thus, the organisation of production is negotiated on a "something for everyone"- basis, not in terms of efficient logistics or improved services.

Crisis 3: Messy appearance/Web organisation

As systems grow and information providers multiply, responsibility for information provision and updating is delegated. This results in each department wanting to do things its own way.

Arises a co-ordination problem; top management wants the organisation to appear in a coherent and stylish form on the Web, following a corporate profile. This interferes with work already done, as well with different ambitions at different departments.

Arises a conflict between departmental interests in service quality, customer contacts, and perceived business mission, and top management's strive for uniformity and rational production overall. Often, a "graphic profile committee" is set up to resolve the conflict. Sometimes - rarely - independent evaluation is involved. This often happens when some external project (for instance EU funding for some user-oriented service) so requires, only occasionally by own initiative.

Crisis 4: Parallel systems

By now, the graphic profile committee has made the system look nice. Contents are produced efficiently, and at least some people use the services. But all manual operations are still in place and run like before. The Web system has not replaced anything. Arises the first cost crisis: "Why is there no process reengineering? The banks introduced automated teller machines, and this made less people go into the offices, allowing for rationalisations. Why does not this happen with our services?"

Re-engineering does not happen without determined measures being taken, since the preserving forces in an organisation are typically stronger than those striving for innovation. One problem here is the scope of reengineering; Process? Department? Organisation? Again, networks at department level are invoked to preserve status qou.

Crisis 5: Choice of future technical platform

Actors: The IT department, different consultants, different business departments, EU projects.

Conflicts:

1) There are technology related choices to make in order to reduce the risk of having to make drastic changes in the future – what database, what Web platform, etc. Still vivid in this debate is the controversy between proponents of the Web and of proprietary systems, like kiosk systems.

2) EU projects often come with a more offensive agenda than that of the IT department. While the former is often directed towards use and service reinvention, the latter is typically defensively focusing on security, standardisation and maintenance.

3) System metaphors. Different business departments typically employ consultants from different trades; Web design/PR, databases, infrastructure, business solutions, etc. These all claim to be in the "IT" business, but they have very different working metaphors for what they build– a library, a database, a newspaper, a brochure, a traffic system, etc. When different departments who have walked the WWW road some time with different consultants at some point have to merge their IT activities, clashes in world views occur. By then, the metaphors have been implemented in software and operations to a considerable extent, making shifts expensive and complicated.

It is typically not until this phase that IT infrastructure strategies are discussed with Web services as an ingredient.

Crisis 6: Cross-departmental integration of data resources

Producers often find that it would be useful to have access to some data possessed by other city departments. For instance, tourist information could be better presented by using maps, which already exist as GIS systems owned by the city planning office or the like.

Appears a need for sharing resources, but how? The answer in practice depends a lot on what legacy systems there are, but also on how far the different departments have come towards telematic service publishing. Those who have come far are likely to want to pursue their way of doing things (often by old technology). Those who have not come so far are typically more likely to try new ideas. Neither is willing to become subordinate to the other.

Problems of this kind are often created by organisational innovations like departmental reforms and internal trade regulations that make cross-departmental use of resources expensive to the individual department.

At this stage, typically another committee has to be set up to negotiate use of "common but divided" resources. Substantial knowledge and visions in the technological field are required in this committee; pure mediation may well lead to old technology prevailing and/or the committee becoming just a forum for inter-departmental struggles.

Crisis 10: From monopoly to service provider

City organisations, and staff, are used to work in a monopoly environment. They are not used to thinking about what users look for, how they look, and so on. The Internet culture, totally different in this respect, as well as deregulation leading to competition with other service providers has begun to demand a change of attitude.

This crisis is only resolved when the city finds its role in the new environment. Different cities may assume different roles; for instance, rural towns often play a more important role in supporting local small business than large cities in prosperous regions do. Only when the role of the city is found can the appropriate roles of the actors in the organisation be properly designed.

Crisis 11: Where are the users?

Many ask themselves about their Web systems: "There is not much use yet – when will it come"?

In our study, we saw that the "media chain" in which the organisations under study worked was missing a crucial link. The development in Web business is towards concentration and exclusion; a few global companies are gaining ground, not least due to the policy of many Internet providers to grant exclusive contracts. Small companies working on a local or regional basis are largely excluded. A problem in the environments we studied - typical for Europe - is that cities are not concentrating on finding and packaging local content, one of the crucial catalysts for getting people on-line. So far, there is not the equivalent of a book publisher or television or film distributor for emerging on-line services, not with a regional focus and ambition. The small company or organisation that want to go on the Web will have to go alone, which is more often than not beyond its capacity.

Crisis 12: Administrative tribal struggles

Man has only recently emerged from a tribal existence. Loyalty to your clan was the leading guarantee of human survival for thousands of years. This legacy sits deep within our subconscious, and is the source of much of the excitement, but also antagonism, at work.

One of the principal problems of the modern society is the difficulty of identifying a tribe to belong to. We feel many sympathies and loyalties, and thereby identify ourselves with many different "tribes" of like-minded people. However, it is not uncommon that our various tribes end up in conflict among themselves. In such a situation, our loyalties are torn, and we are forced to take sides, often against our will.

The stated goals and business practices of many professional organisations are widely disparate. Municipalities may openly wish to serve their members efficiently and well, always seeking for ways of improving their service, and cutting unnecessary costs. As a professional community, however, city officials wish not to

rationalise away city jobs, because that would decrease state subsidy to the city, as well as its relative economic importance in a region. It would also aggravate the city's financial position, by pushing former employees into the ranks of the unemployed.

In such a situation, members of the corresponding "professional clans" are torn between loyalty to their explicit professional mission and that to their professional community.

Introducing telematic services amounts to changing established service patterns. The professional staff influenced by such a perturbation will be divided by their tribal loyalty. If the tribal chief or council concludes that such services will do more harm than benefit to the tribal community, the telematic service will prove cumbersome and awkward to use, and definitely too immature to be seriously considered for operational adoption.

DISCUSSION AND CONCLUSIONS

We found twelve distinct "crises", situations where goals, environment, and actors change, and the process is found in a stage of improvisation until new stability is achieved. We saw that:
1) The Web was in practice a "cuckoo in the nest", intruding in ever more activities and introducing new demands on them.
2) This generally came as a surprise.
3) There was typically a missing link in the organisations' infrastructure to deal with electronic services. Web projects were considered technical projects; though in fact issues pertaining to users and organisation were most important, they were initially largely neglected. The missing link was a "electronic service manager" (ESM), a body competent of managing the whole process of bundling services from different service providers and publishing them in a coherent fashion, providing support to service providers during the process of inventing, refining, and evaluating services, improving logistics, and conducting the necessary but typically ignored activities of analysis of the quality of services, and policy making.

All along, there were a couple of stabilising factors. Most important, we think, was the general technical development and market demands; The Web has continued to grow and improve technically, and people today demand Web services also from government.

A second stabilising factor was central government policies. All the studied countries had national government policies of the type cited in the introduction. Also, in every city there were several EU funded projects where electronic services and the Web were understood as the way to go. These projects influenced cities by their goals and activities, but also because they over time have fostered a cadre of "Web champions", city staff with international contacts and visions of technology use for service improvements.

Of the crises identified, ten out of twelve (all except no 5 & 9) belong to the area of users and usability of services and the ensuing demands on organisations. Yet projects were pursued as "technical projects", not as service projects. Why was no business innovation entity (the "ESM") set up? We have discussed the development in terms of how different actors influenced the view of technology at different stages of the development. We saw that these views changed considerably over time, and that the changes were not planned or foreseen. They evolved as new actors entered the scene. There was never an overall tactical plan which outlined "the road towards proficient electronic service management", just plans for "implementing a Web system", "making our system usable", etc. The cities acted reactively, often successfully, but typically not proactively.

Was infrastructure "implemented" or did it "drift" due to events down the road; we saw that there certainly was a lot of drifting if we see the different crises in relation to the overall goal of professional telematic service publishing. But that goal appeared only late in the process. There was no grand plan. There were a number of activities, including plans for short-term developments, which together led to the development of an infrastructure.

Looking at each "crisis", the drifting was not appalling. Certainly there were conflicts, and certainly departmental interests, or even those of individual actors, made a great difference. But in most places solutions to the problems encountered at a particular crisis were found, that were digestible for all parties.

There is a great lack of strategy in the field of electronic services in local governments in Europe. This is a major problem in the light of the importance of that sector and the challenges it is currently facing.

The electronic services business in Europe's public sector is a cottage industry. It needs to be modernised. The solution is not more home pages but a service perspective professionally and visionary implemented.

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