

ABSTRACTION OF EGOVERNMENT

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ABSTRACT

The researcher has spotted numerous research efforts concentrating on the idea of technology platform integration and standardization (e.g. Tambouris (2001), Scholl 2005, Marinos Themistocleous and Zahir Irani 2005, Anthopoulos & Tsoukalas, Klischewski & Jeenicke 2004, Punia & Saxena 2004, Klischewski 2004, and Janssen & Cresswell 2005). In the researcher's view this is most rewarding for governments that do not yet have an IT infrastructure and plan to establish one. Most governments, however, have already disparate systems in place. Each of these systems is usually built to serve a particular department that has predefined requirement. In most cases, there is a lack of vision of integration as decisions upon technologies are taken by the Local Governments—LGs.

In firms, though, the decision is mostly central and any new system or platform with typical size is normally planned to be interoperable. In democracies, LGs have autonomous status. Resistance to change can be more evident than in businesses. There is also a tendency to keep information private. This hinders much of the integration efforts. Also the cost for integration and rebuilding the IT infrastructure with the new standards can be awfully far above the ground.

That said; it could be better and cheaper to adopt a different approach. "Encapsulation" of eGovernment can face far less resistance and demand much fewer costs. This idea has a lot in common with Object-Oriented methodologies that are already applied in some businesses.

The purpose of this paper is to introduce a model that materializes this idea of encapsulation. It would only touch on the technical aspects of the model, but at large the model will be conceptual.

KEYWORDS

eGovernment; Model; Abstraction; Government Entity

1. INTRODUCTION

LGs including municipalities in modern democracies have a certain level of autonomy. This stems from one of golden rules of a democratic society: division of authority.

Naturally, priorities and budgeting govern the work of LGs.

This differs much from businesses where decisions are centrally made. Research has shown that communications and information flow from departments to headquarter is far more frequent and solid than for LGs to central government (Scholl 2005).

As the purpose of establishing an LG is different from that of a firm the nature of each is different and the models to be used for their operation would also be different. Another study (Grönlund 2004) has revealed the following discrepancies:

- A firm aims to maximize profit but a government furnishes its citizens with services and maintains stability and well-being of the society. The latter is obviously not a clearly defined goal.
- Citizenship (relationship between a citizen and the government) is very different from consumership (relationship between the customer and the firm). The paradigm of relationship management is different for each.
- A government follows legal and policy processes while firms normally have administrative and technical ones.
- Business value drives business whereas constituents' needs drives government actions.

That said; the implementation of IT in business is different from that in government. This difference is manifested as:

- In governments, the technical orientation is focused on: eGovernment, eWorkflow (Processes), and eDemocracy (eParticipation and eVoting) whereas the focus is on eCommerce, eBusiness, Outsourcing and Integration for businesses.
- Interoperability and data-sharing across levels and among branches, obstacles are mostly legal, political, and social, technical aspects being the least (Scholl 2005).
- Decision-making in businesses is central and leaves little place for empowerment of employees. This leads to managerial, organizational, and technical problems.

While information sharing among government units or LGs improves transparency, government units are reluctant to share information for many reasons. This has to do very much with the stiff bureaucracy in their working environment. Government units remain much like silos where cross-functional processes barely exist. Each unit maintains a sort of autonomous status and specific processes, which are not very well integrated with other processes in government units or LGs. This causes inefficiency in productivity. It restrains transparency as well.

Most businesses nowadays implement cross-functional processes and abandon silos style of operation to make a more flattened and thus flexible and efficient workflow (Laudon 2006). This methodology cannot be directly applied to governmental units as the emphasis for the latter is correctness and credibility rather than speed and efficiency.

In short, "A government is not a firm". Borrowing successful models from business does not necessarily mean that they will also work well for governments.

2. THE PROPOSED MODEL

We saw that LGs are reluctant to share information or are not enthusiastic to say the least. Research shows that this tends to be a major hindrance for implementing platform integration projects. Costs can increase rapidly and complexity mounts exponentially.

Our model approaches these problems in particular. Instead of supporting full information sharing and integration it just concerns the interfacing among. Thus maintaining much of the well-defended bureaucracies within LGs. The proposed model respects and preserves these long-living bureaucracies.

The proposed model is analogous to the well-known Object-Oriented design methodology. It views LGs as sort of autonomous "objects" with each object possessing information-hiding properties (reluctance to share information). This way the whole model is not very much concerned with the detailed workflow or processes within each object but is rather concerned with the interfacing among objects (LGs). This renders the whole system platform modeling easier and cheaper to implement. It reduces complexity down to the minimum. At the same time it best fits the nature of democratic government units and LGs as it preserves bureaucracy.

This model enables a government to implement its IT platform incrementally instead of all-at-once and thereby minimizing cost and risk of failure. A staggering 35% of e-government projects are total failures, some 50% are partial failures, and only 15% are success stories (Punia & Saxena 2004). Government

processes play a significant role in the success of an e-government project (Punia & Saxena 2004). Unlike business processes government processes are plagued by (Punia & Saxena 2004):

- Processes are vertical and not cross-functional: This is due to the fact stated above that government structure is hierarchical and departmental (vertical silos) which renders processes inefficient.
- Lack of ownership: It is hard to specify the responsible person(s) or unit(s) for part or all activities within a process.
- Absence of practical measurement of process performance: Bureaucracy has to do much with this problem.

Given these facts, it becomes obvious that process integration in eGovernment is even harder to achieve than in businesses. This manifests another quality of the proposed model which hides the details of each e-government process within an LG or government unit. It is only concerned with inputs and outputs of each process. It does, however, support the integration of bigger processes across LGs.

The proposed model leaves much of the internal processes within an LG intact. This allows piloting and testing systems in LGs with minimal risks. This approach mitigates effects of change of roles on the side of government employees making it easier to conduct a robust change management process. Change, as such, is kept minimal.

Change management is crucial for a successful implementation of a new large-scale project. It has to be said that employees, in general, hate to change the way they used to work for lengthy periods of time. To adapt to a new IT system, is often resisted by some employees because of the obligation of training on the new system and the possible change of responsibility/authority. This problem can play a significant role in the failure of a project (Laudon 2006). Government employees, in particular, are even more resistant to change. They work in bureaucratic hierarchies as opposed to business employees who work in a relatively more flexible and changing environment. They even intend sometimes to disrupt the whole project implementation process putting at risk all efforts made to make a new system a reality.

2.1 Components of the Model

In order for the model to be working and in order to achieve the objectives stated above it should comprise the following basic components:

2.1.1 Governmental entities

Government Entities (GEs) are viewed as black box entities each representing an autonomous governmental unit that hides its internal processes and flow of information. This component can typically be an LG or a governmental unit. Each GE has the ability to interact with one or more other entities within the model through interfaces. A particular GE does not have to know or even to follow the same operational procedures as any other GE. This maintains its assumed autonomy. It does not threaten the long-living bureaucracy and hierarchy of the LGs because of the use of interfaces that have built-in correspondence protocols. Thus no operational or behavioral change is needed in any of the GEs (see Figure 1).

2.1.2. Interfaces

Interfaces achieve the sought separation of responsibilities and distribution of authorities among GEs. Interfaces reflect the protocols set forth by the government or the political system. These protocols should be implemented carefully and accurately as they control and coordinate the relationships among GEs as per regulations set forth by the government. Interfaces describe in great details the type of information that a particular entity can provide (e.g. personal records of a citizen) as-well-as the services that this particular GE can provide (e.g. issuing a passport) (see Figure 2). Interfaces are responsible for Cross-GE process integration.

2.1.3. Messages

It was mentioned above that interfaces in any GE should be finite and clearly defined. They represent the information and services (operation or tasks) that a particular GE can offer. To request a service a message must be sent to the concerned LG. These messages can originate at some GE. Each message sent must

include its origin and information or the name of service requested. Built-in in each message are the proper authorizations and identifying information of the sender.

2.1.4. Access points

Access points (APs) act as inputs and outputs between the system and the environment (social bodies including citizens, businesses, and civic organizations). These APs are the closest to social bodies. Through these APs or "portals", social bodies can request services or information. These requests trigger consecutive messages and activities (processes) throughout the concerned GEs until the requested service is complete and a feedback is delivered through either the same AP or another one.

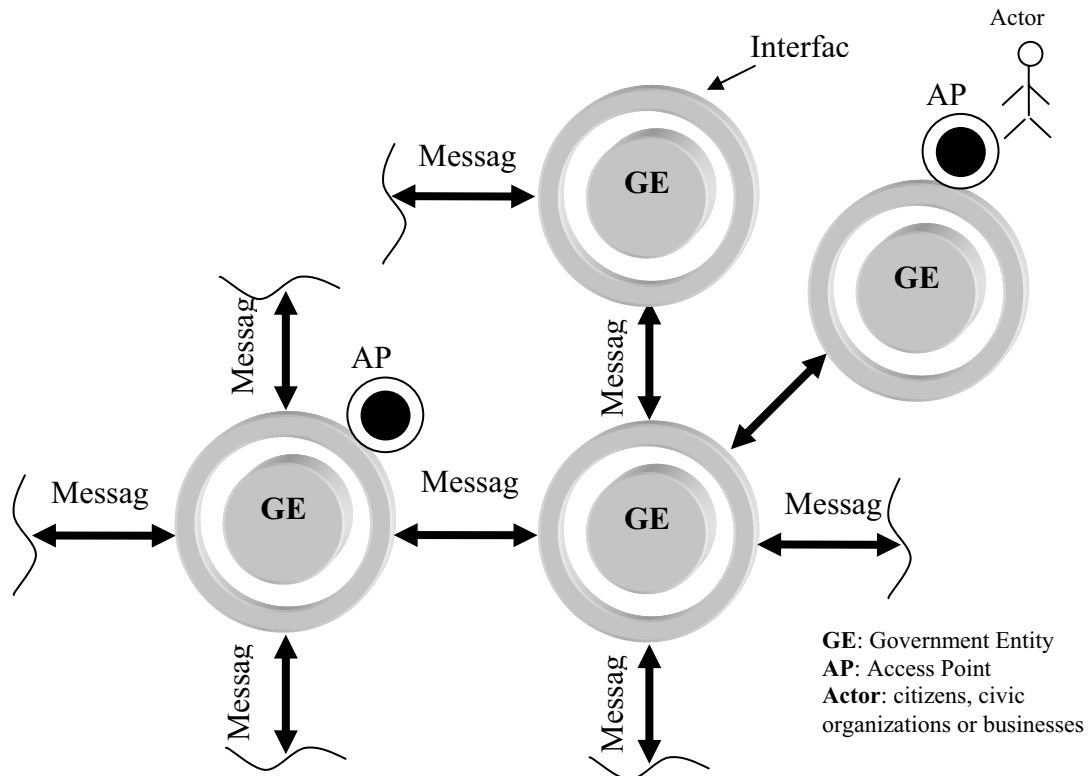


Figure 1. Relationships that exist among Government Entities—GEs through interfaces

From the description of the proposed model we realize that it can best fit a democratic governmental system which is based on the idea of distributing authorities and the empowerment of autonomous LGs as mentioned earlier.

This model is not the best for totalitarian regimes where decision making is central and implementation propagates from the top central government to its branches with a little degree of autonomy.

A particular GE does not have to know or even to follow the same operational procedures as any other GE.

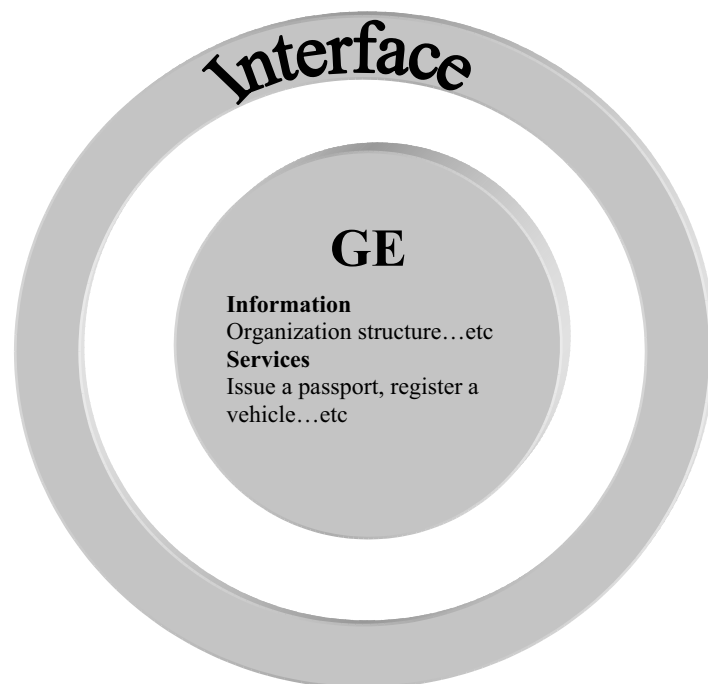


Figure 2. A detailed view a typical GE

3. A POSSIBLE TECHNICAL IMPLEMENTATION OF THE PROPOSED MODEL

This section describes briefly the IT systems that can underlie the proposed model.

Each governmental entity may have its own back office systems. These could be Legacy Systems that are very difficult to be integrated into other (normally new) systems. This, inarguably, entails that different GEs can have different data formats. This should not raise a problem with the proposed model because it was originally built around the idea of encapsulation of disparate systems. However, these systems should be able to "talk" to one another regardless of the hardware or software used in each of the GEs. The idea here is to make common interfaces among the GEs and not to make a common platform. This cuts down intricacies and lowers costs dramatically as mentioned many times in this paper. This can be achieved fairly easily by using interfaces as described above in Figure (1).

But how can interfaces become common among disparate systems? A lot of research e.g. (Tambouris (2001), Traunmüller & Maria, ICA Country Report 2004, Bochicchio & Longo 2004, Scholl 2005, Punia & Saxena 2004, Mugellini et al., Anthopoulos & Tsoukalas, Spahni 2004, Klischewski & Jeenicke 2004, Henriksen et al. 2004, IT Pro 2003, and Smith & Adams 2005) suggests the adoption of the eXtensible Markup Language--XML. The power of XML over the more traditional HTML format is that it describes not only the content and formatting but also the meaning and properties of each element in the document (Ontology is a research field that explores the momentum of conceptual search over the Internet). The advantage is quite obvious when searching through a document. Search results will be conceptual rather than simply matching out texts. For multi-lingual countries (like Switzerland, Belgium...etc) this could be quite advantageous because the search will be concerned with concepts regardless of the original language used to write the document.

Each government can come up with its own specific XML document formats that some call GML. GML is simply a government-customization of the well-known XML format. Typically GML document formats have common terminologies that describe all sorts of information a GE can work on. This format is obligatory to be adopted by all GEs when communicating electronically with one another.

Thus the only interfacing (bridging) required among LGs (GEs) is the unified data format through the use of GML as suggested above. The other things however can remain the same. Thus hardware and software can be left as is without alteration. Clearly, this cuts down costs sharply. There might be a need however for a middleware (a software used to convert data formats from one form into another) in case the installed software in one of GEs does not support GML (XML) format.

The proposed model is indispensable when building a large-scale governmental portal. A governmental portal provides one-stop access to governmental services and information. One-stop government refers to the integration of public services from a citizen's point of view (Tambouris 2001). A governmental portal can collect information from different GEs simply by sending messages to the interfaces of the GEs concerned. The local content is compiled by local GE(s). And so this makes it easy to manage complexities of hyperlinks and document formats. Hyperlinks and local URLs are maintained by the GEs. Document formatting, layout and style can then be standardized by applying Standard Governmental CSS to the received local content.

Searching for a specific content can now be based on concepts and not occurrences of text and independent of the language used for search. This should yield accurate and structured results. This feature is indispensable for multi-lingual countries as mentioned before. This can as well be vital for foreigners living in a country and who need to access governmental information or services where the official language is not their mother tongue.

In the following section we shall see a successful implementation of a similar approach.

4. A SIMILAR APPROACH OF IMPLEMENTATION

For such reasons as reducing management of URLs of Switzerland's 2842 communes (ICA Country Report), the Swiss government has implemented an approach similar in part to the proposed model.

The Swiss case is typical in the sense that the country is highly heterogeneous.

It is a federation of originally 26 states and now called cantons (ICA Country Report). Cantons, in turn, are divided into communes. Currently, there are 2842 (ICA Country Report). On top of that these communes speak four different languages (German, French, Italian and Rhaeto-Romanic) (ch.ch).

Regulation and standards are set forth locally which means that communes have a high level of autonomy which is basically granted by the cantons they belong to.

That said; it was hard to come up with a single system that is administered centrally down to the granular details.

The Swiss government has developed a single large-scale portal (www.ch.ch) that draws its information and services from the local communes. The idea was to distribute the underlying system of the portal among the local communes. This is in line with the proposed model. Hyperlinks and online resources are maintained locally by the each commune.

The portal was a success attributed to the Swiss government. It has been working seamlessly since 2003 and it lived to its promises of providing one-stop governmental portal to Swiss citizens and foreign nationals.

5. CONCLUSION

We have proposed a model for an eGovernment initiative that can simplify implementation of a naturally intricate IT platform that supports both back and front office applications. The idea behind the proposed model was to encapsulate local governmental entities in a democratic political system that is based amongst other things on distributing power and authorities. As we've seen the proposed model has the capacity to cut down huge expenses because it no longer requires the development of new software or replacement of hardware already in place. This also saves costs usually incurred by training employees on new systems (hardware and software). In addition it assures minimal changes in the working environment of government employees. This reduces risk of project failure dramatically. Research shows that unaccounted-for change is a primary reason for failure of projects of this kind because of employees' resistance to changing the way they used to work (Laudon 2006).

The greater the diversity in terms of systems language...etc inside a country the most indispensable the proposed model would become. If the model has worked for an extreme case like Switzerland with all its diversities and variation -see case above- it should definitely work for less extreme cases.

The proposed model supports encapsulation or information-hiding. Thus, an LG can decide on the degree of transparency they want to have. They can either open up more their internal processes and information and thus improve transparency or they can hide and reserve their internal processes and information and thereby limit their transparency and strengthen bureaucracy. This can be a double-edged sword on the one-hand, the model preserves and even boosts bureaucracy but only if the LG wants to do that. On the other hand, the proposed model welcomes the opening up of internal processes to enhance transparency and objectivity.

A downside of the proposed model is that it can hamper innovation. As long as software and hardware are running properly they will not be changed as often (when an interesting new technology debuts for example).

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