Inter-Governmental E-Government Processes: Comparison of Different Solution Approaches

- Based on Examples from Switzerland / Europe

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ABSTRACT

The main objective of this article is to describe different solution approaches for e-Government processes across different institutions at different levels of public administrations: a phased approach for specific e-Government solutions and a platform approach for cross-organisational public services. We discuss selection criteria for the different approaches considering several examples and indicate a relationship between the expected return-on-investment and the complexity of the solution.

Keywords: Inter-governmental processes, E-Government, Data Exchange Platform, Return-On-Investment, Solution Complexity

INTRODUCTION

In the past years, the usage and importance of e-Government applications increased more and more. The people demand, that their business with the public administration is processed simpler, faster and more economically. After some years of experience, it became apparent that the values and benefits of e-Government only partially materialized, because states (Cantons, Counties) or municipalities rather independently developed similar solutions for similar problems and introduced them accordingly in an isolated manner. For instance, for a moving person, who intents to perform the operations electronically, there will be only a limited benefit, if he can complete the interaction electronically with one municipality, however the other municipality still provides a conventional procedure only. This results in an increasing demand to the authorities at each level to open towards other institutions and to establish business processes across different institutions.

INTER-GOVERNMENTAL PROCESSES

The situation in Switzerland, which is mainly discussed here, serves as representative example for a complex federal structure with its three levels of administration: federation, states (in Switzerland called "cantons"), and municipalities. Government Levels (e.g. Switzerland):

- Federal Government (1)
- Regional Governments (26 cantons)
- Local Governments (2880 municipalities)

We can distinguish following different types of inter-governmental processes:

1) **Processes across levels within a (federal) structure**

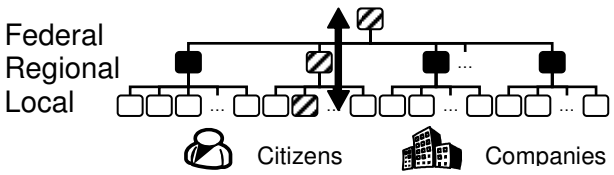

Figure 1: Processes across levels within a (federal) structure

Examples:

– Electronic processing of work permit applications & central registry of foreigners (Government to Citizen (G2C) and Government to Government (G2G))

- Electronic income tax declaration (with specific calculation at each federal level) (G2C and G2G)

2) **Centrally governed services and processes**

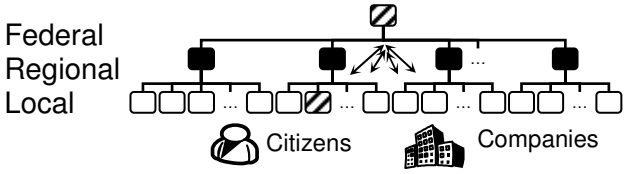

Figure 2: Centrally governed services and processes

Examples:
- Registry based e-census (G2C) or e-Voting (G2C)
- Distribution of electronic National ID Cards (G2C)
- Electronic processing of Value Added Tax (VAT) declaration (Government to Business (G2B))
- Central Procurement (G2B)

3) **Peer-to-peer processes relying on registries and networks**

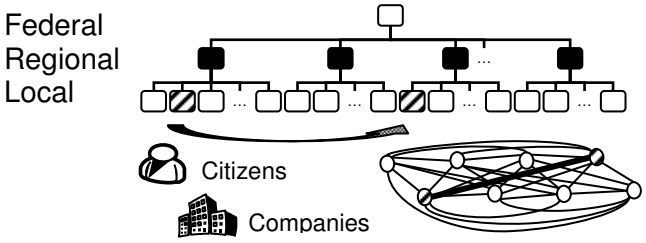

Figure 3: Peer-to-peer processes relying on registries and networks

Examples:
- Relocation of an office (G2B & G2G)
- Move of person or family and change of personal data: place of residence, marriage, etc. (G2C & G2G)
- Pay national insurance for servants, request social funds (G2C, G2B)

Inter-governmental processes are also of particular interest at European level: IDA (Interchange of Data between Administrations) is a European Commission driven strategic initiative using advances in information and communications technologies to support rapid exchange of information between administrations [1], the Online Services Computer Interface (OSCI) in Germany is another example [2]. For complex inter-governmental processes, solution approaches are required, which also take into consideration the federal structures.

DRIVERS & STAKEHOLDERS

The main drivers behind inter-governmental processes are (1) the interests of different interest groups and (2) some specific legal, social or political events concerning the public administration.

The most important **group of interest** is the citizens, who place higher requirements to the public administration: higher availability, faster response times, status information about their requests, etc. Citizens are perceived as customers, and the public administration accepts its role as a service provider. The public organizations and the commercial sector, therefore, share the objectives of the citizens and, in addition, they are interested in a reduction of their own expenditure and cost (e.g. by electronically processing the Value Added Tax (VAT) collection). A large challenge is to align the e-Government strategies of the various hierarchical levels of organisation in accordance with the inter-governmental business processes. The political authorities represent all the groups of interest mentioned above, but often their interests are overlaid by rather short-term topics, because visible results have to be shown within one legislative period.

Besides that, there are also some **specific legal, social or political events** concerning the public administration, which drive the introduction of electronically supported processes. An example is the register-based electronic census, which is planned in Switzerland for 2010. For e-census, uniform registry definitions are created, i.e. a catalogue of standard attributes for natural persons, which can also serve as basis for other applications (e.g. system of registration). Another example is the introduction of biometrics into passports and other identification documents. This is why the compliance to common standards is a mandatory prerequisite for the success of e-Government. **Standardisation** of e-Government is for instance the aim of the German e-Government standard SAGA (**S**tandards and **A**rchitectures for e-**G**overnment **A**pplications) [3]. Besides national requirements, also those processes have to be regarded, which go beyond the national borders, (e.g. the compliance of Switzerland with the European Union interest taxation agreements).

PREREQUISITES & BOUNDARY CONDITIONS

Before speaking about e-Government solution approaches for inter-governmental processes, the legal, political, economical and social prerequisites and boundary conditions have to be taken into account.

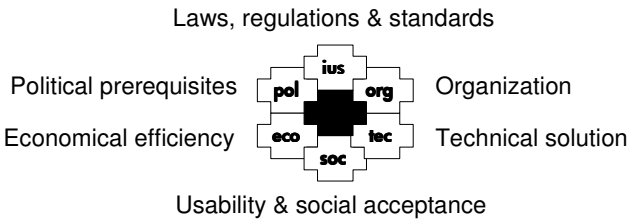

Figure 4: Technical & organisational feasibility are put in context with legal & political prerequisites, business cases & economical efficiency, usability & social acceptance.

- Compliance with the **legal** situation on a regional, national & international level is mandatory. For instance, legal requirements with respect to data sovereignty or regarding the autonomy of the specific government organisations have to be taken into account. Driving questions are: Who owns the data, when it is stored or archived, transferred or distributed? How to apply the respective data protection laws to assure privacy and secrecy of the data? Occasionally laws might even have to be adapted in order to satisfy the requirements of electronic processes and data exchanges (examples: many European countries introduced digital signature laws, Switzerland introduced a law to allow electronic voting, etc.).

- **Political** authorities set the fundamental directions and define the strategies, i.e. the e-Government strategies at each level of authority. To what extent cooperation models are accepted by the concerned parties is primarily a political question, and it does less depend on laws, costs or technologies. In order to push inter-governmental processes, all the involved political authorities must support, contribute, sponsor and drive the respective e-Government initiative or solution (example: BundOnline 2005 project in Germany driven by the ministry of interior). Local government institutions often question: What are their incentives in a federal context with local efforts and central benefits? There is obviously a trade-off between central harmonization and regional autonomy to resolve.

- Only projects with a sufficient **economical** efficiency, which fit into the limited financial budgets, will have a chance to be realized. It is a particular challenge to prove the evidence of the business cases, if cross-organisational processes or public services are concerned (example: electronic ID card in Austria and other countries planned to serve as means of identification to most e-Government services).

- Only with a reasonable acceptance by the **society**, sufficient benefits and proven values for all participants, the efforts towards cross-organisational e-Government processes make sense at all. A solution must prove its usefulness and value in order to be accepted by the society.

The approach becomes comprehensive by adding to that context of legal and political prerequisites, economical efficiency, and social acceptance also the technical & organisational feasibility. The **technical** & **organisational** aspects will be discussed further below as part of the solution approaches (see Figure 4).

SOLUTION APPROACHES

The above-mentioned basic conditions make it difficult to find organizational and technical solutions, in particular within a federal context, when decisions cannot be made centrally, but have to be reached by consensus. We distinguish two fundamentally different strategies for designing, implementing and operating e-Government solutions (s. Figure 5):

- a **phased approach** for specific e-Government solutions and

- a **platform approach** for cross-organisational public services.

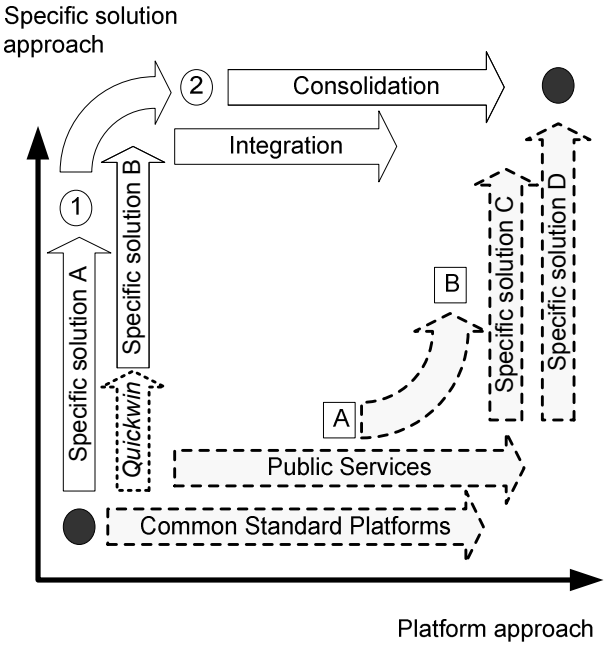

Figure 5: Procedural models for the different solution approaches – a phased approach for specific e-Government solutions (1) → (2) and a platform approach for cross-organisational or public services (A) → (B).

Phased approach: Specific e-Government solutions are characterised by an evolutionary character: individual specialized solutions are developed in phases (1), and afterwards, the solutions are integrated at the organisational interfaces and consolidated on a standardized platform (2). A Swiss example is the electronic work permit application, which was implemented in Zurich and other Cantons and which is integrated with the central registry of foreigners in Switzerland.

The **platform approach** provides cross-organisational public services, which are used by several institutions (national federation, states/cantons, municipalities) and/or by several specific solutions. First (A) a uniform standard platform is established, from which then individual specific e-Government solutions can benefit (B). Whenever a commonly used service is made public, a standard platform is recommended, which requires a platform approach to be pursued. The on-line payment with credit cards is such a typical cross-organisational business service, which is already widely used by many other e-Business solutions. Several international e-Government studies have shown that the lack of online payments and of secure online identification inhibits many e-Government services, which then are limited, for instance, to the download of forms etc.

Electronic ID-card as typical example for the platform approach: The introduction of an electronic personal identification card, which could also be used for online services, will take several years. Several countries – like Italy, Belgium, Finland, Sweden or Estonia – already run electronic ID-card pilot projects, and the EU started an initiative to define an international eID-card standard [4]. One of the reasons for the lack of cross-organisational or public services is that the necessary platform approach requires substantial initial investments. For specific e-Government solutions, on the other hand, a phased approach can be selected, which permits extensive pilot projects and more moderate, iterative investment cycles. This approach cannot be applied when introducing eID-cards. However, also regarding public services, investments can be narrowed, e.g. by just enhancing existing processes for online purposes. For instance, the investments for the introduction of an electronic ID card can be restricted to marginal costs, if the existing process for manufacturing and issuing conventional ID cards is just modified to assemble the ID cards with a chip, which stores the personal information electronically accordingly. In addition, all new PCs have to be equipped with card readers, by default. Of course, the rollout and replacement process for eID cards and readers will take about four to five years, and e-Government might benefit slowly over time, but once established, the business value will be significant, not only for the public administration [5].

Conclusion: For each problem area, the suitable solution approach must be selected depending of the purpose of the service: either a specific e-Government solution with a limited user group and limited scope of application or a cross-organisational or public e-Government service, which can be used by a growing network of users with broad ranges of applications.

ORGANISATIONAL MODELS

Several e-Government studies show evidence that countries with complex federal structures often can be found at lower ranks in international comparisons than countries with central structures (e.g. Brown Policy Reports [6]). Federal states substantially suffer from a much larger synchronisation and harmonisation effort within and between the different decision levels.
There are several approaches to push standardisation in e-Government, e.g. on the level of the EU as part of eEurope projects [3], the IDA (Interchange of Data between Administration) Programme and the the successor IDABC (Interoperable Delivery of European eGovernment Services to public Administrations, Businesses and Citizens). In Switzerland, government institutions on local, cantonal and federal level, as well as companies and even individual citizens jointly founded the association eCH [7] in order to define common standards for e-Government processes, data, and architectures.
The **foundation of a non-profit association** shows that also different more informal organisational models can successfully promote inter-governmental co-operation. An organizational model of an independent non-profit association can be used not only for the definition of standards but also for the implementation and operation of inter-governmental processes. Example: In Switzerland, the TelDaS association [8] was founded in order to assure different types of transactions between the Swiss telecommunication service providers. TelDaS guarantees, for instance, Number Portability between Operators and offers the functionality for Individual Number Allocation.

TECHNICAL SOLUTION MODELS

The basic elements of a solution for inter-governmental e-Government processes are (s. Figure 6):

1) **Business processes:** a precise definition of the processes, the exchanged data as well as the tasks and responsibilities of the participants. Who initiates and performs which tasks according to which rules? Who possesses the sovereignty over which data at which time?
   Process Template: Registry A → Adapter → Transformation → Data Exchange Platform → Secure Transfer → Transformation → Registry B

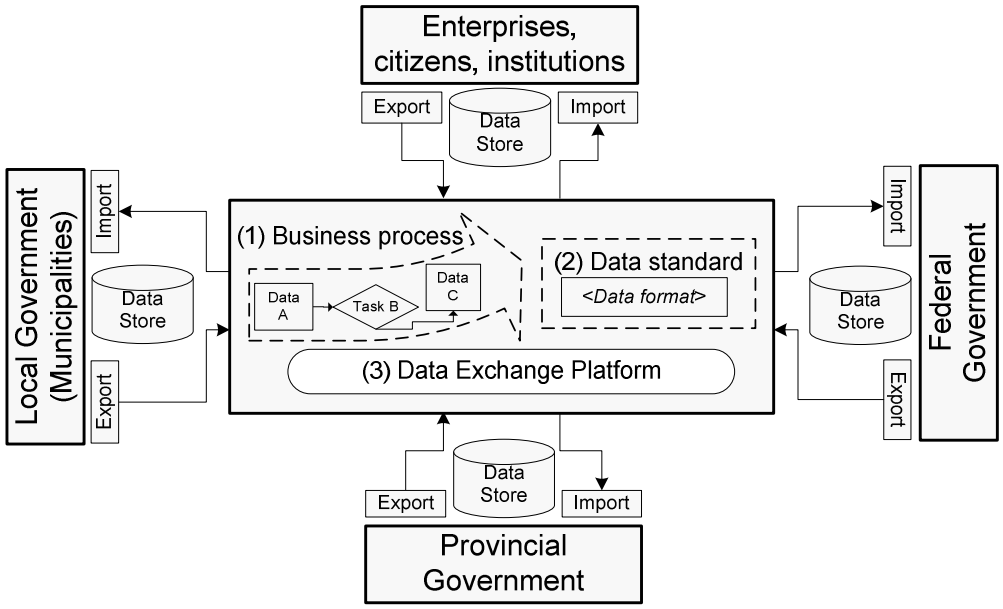

Figure 6: Inter-governmental Data Exchange Platform – the basic elements are: (1) precisely defined business processes, (2) comprehensive uniform data standards and (3) technical platform for data exchange.

2) **Data standards:** a data model, which facilitates the simple, safe and complete exchange of data. Should the data model for the data exchange cover all existing flavours being a superset of the data models of the surrounding systems? Or can adjustments to the data models of the surrounding systems be imposed?

3) **Data Exchange Platform:** a technical solution platform with business logic for rule-based electronic data exchange, on which the processes and data transformations are executed accordingly. Should such a system be developed for each specific solution individually? Or can such a solution be provided as cross-organisational platform, which serves to interchange data for various purposes and applications?

Example: The European IDA eLink, for instance, is a project to develop a communication middleware for application-to-application communication, comprising the identification of remote services through a services directory and the provision of reliable and secure transport services over proper network infrastructure. IDA activities on eLink originated from a set of generic specifications for exchange, dissemination and collection of data, primarily between authorities in the public sector, but also between citizens and the public sector, and enterprises and the public sector [1].

RETURN ON INVESTMENT CONSIDERATIONS

For the measurement of success of e-Government solutions, it is important that the expectations regarding the **Return on Investment** take into account the complexity of the solution. The complexity of an inter-governmental solution can be a linear or quadratic function of the number of involved institutions.

If the complexity grows **linearly**, a **phased approach** can be selected, which permits moderate and iterative investment cycles. Consequently, the resulting benefits and return on investments should be seen continuously, i.e. linearly growing over time. Typically, the number of possible point-to-point connections for cross-organisational or public services grows like the square of the participating institutions. Hence, the complexity of such a solution shows **quadratic** behaviour. In order to manage the complexity, a platform solution is strongly recommended which allows all institutions to connect to that platform. However, the **platform approach** requires substantial initial investments, before benefits and return on investments are seen over time (see Figure 7).

Taking into account the necessary investment behaviour, the expectations of the involved parties have to be managed accordingly, and eventually, incentives must be created in order to stimulate the success.
So-called **Quick-wins** are an exceptional situation in e-Government, and in particular, when inter-governmental processes are concerned. **Quick-wins** may exist for smaller problem areas with a limited scope, low marginal investments and high marginal profit.

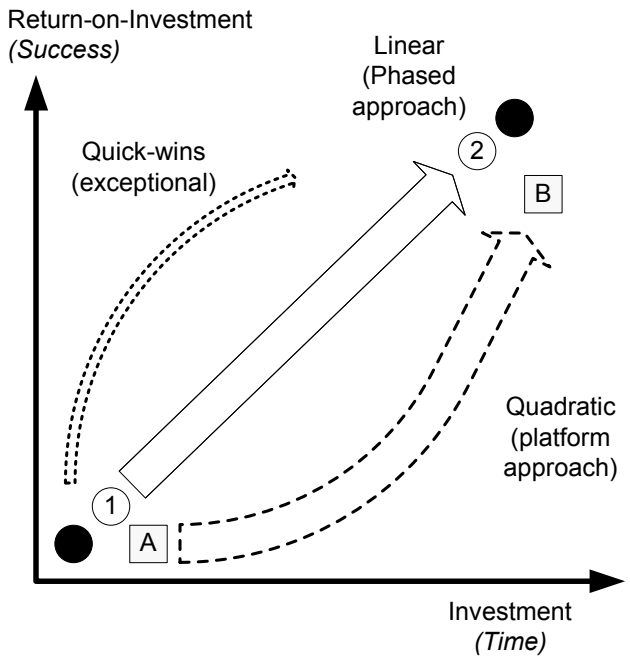

Figure 7: Successful business models – Return-on-Investment is expected in accordance with complexity of the solution approach: (1) → (2) phased approach permits moderate iterative investment cycles, consequently success is seen continuously, i.e. linearly over time. (A) → (B) A platform for cross-organisational or public services requires substantial initial investments before an appropriate return is seen. So called "Quick-wins" are rather exceptional.

System of registration as example of a (quadratic) platform approach: The Swiss statistics reports about 400'000 moves per year, i.e., about 5% of the Swiss population could potentially benefit of an electronic registration process – apart from additional efficiency gains for the public administration. The problem is that electronic interfaces are necessary at both municipalities involved in the transfer. Unless a common platform for electronic data exchange already exists, the complexity of an electronic solution rises squarely with the number of the municipalities involved. Even if 50% of the registration systems in the local governments are equipped with electronic interfaces, only about 25% of the moving people can benefit, which can be taken as measure for the success. More significant savings and efficiency gains can only be achieved with a rapid propagation of a data exchange platform.

Electronic work permit application as example for a (linear) phased approach: According to the Foreign Labour Department of the Canton of Zurich [9], their e-workpermit solution could accelerate the application and issuance of work permits tremendously. The more efficient electronic work permit procedure without media breaks is very attractive and a win for all involved parties, public administration, foreign citizens, and their companies. The complexity of the solution scales with the number of the involved parties, and the return on investment shows a linear behaviour over time, accordingly.

REFERENCES

[1] **IDA (Interchange of Data between Administrations)** and the successor **IDABC (Interoperable Delivery of European eGovernment Services to public Administrations, Businesses and Citizens)**, European Commission driven strategic initiative to encourage and support the delivery of cross-border public sector services to citizens and enterprises in Europe, and to improve efficiency and collaboration between European public administrations (see: http://europa.eu.int/idabc).

[2] **Online Services Computer Interface (OSCI)** is the name of a standard protocol for the exchange of legally accepted, electronically signed and encrypted documents between private and public service providers and their customers in Germany (see: http://www.osci.de).

[3] **SAGA – Standards and Architectures for e-government Applications** (Version 3.0, see: http://www.kbst.bund.de/saga), documents are also available in English (Version 2.0).

[4] **The eEurope Smart Card (eESC)** initiative was launched by the European Commission in December 1999 in order to accelerate and harmonise the development of smart cards across Europe. The European Committee for Standardization (CEN) established Workgroup TC224 WG15 and published a couple of CEN Workgroup Agreements, e.g., CWA 15264 Architecture for a European interoperable eID system (http://www.cenorm.be/)

[5] Frank Zimmermann, Elektronische Identitätskarte – Problemstellungen und Lösungsansätze, in «eGov Präsenz» 02/2003, **Journal of the eGovernment Competence Centre of the FH Bern**, August 2003.

[6] **Brown Policy**, Global E-Government Full Report, August 2006, (see: http://www.insidepolitics.org).

[7] The association **eCH** promotes and defines e-Government standards in Switzerland (see: http://www.ech.ch). Members are from the public administration, private companies, and individuals.

[8] **TelDaS (Telecommunication Data Services)** was founded as an association by the Swiss network service providers, which guarantees Number Portability between Operators and offers the functionality for Individual Number Allocation (see: http://www.teldas.ch).

[9] **Foreign Labour Department of the Canton of Zurich** (AWA Amt für Wirtschaft und Arbeit des Kantons Zürich, see: Arbeitsbewilligungen on http://www.awa.zh.ch also available in English).

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