Organizational Requirements for Building up National e-Government Infrastructures in Federal Settings

Marianne Fraefel
Bern University of Applied Sciences
marianne.fraefel@bfh.ch

Thomas Selzam
Bern University of Applied Sciences
thomas.selzam@bfh.ch

Reinhard Riedl
Bern University of Applied Sciences
reinhard.riedl@bfh.ch

Abstract

The present paper focuses on the interplay between the organizational dimension of e-government and the development of national e-government infrastructures. The discussion is aimed at clarifying whether and how a decentralized vs. central development of re-usable basic services raises different requirements with regard to establishing inter-organizational arrangements and coordination. Current challenges in the development of decentralized, federal Switzerland are compared to other federal and non-federal countries, based on document analysis and interviews with e-government experts in Switzerland, selected European countries and Canada. Against this background, an organizational framework is developed that is aimed at overcoming common obstacles for developing an integrated e-government approach across national tiers in Switzerland. The cross-country comparison reveals considerable similarity regarding pressing challenges. The framework may therefore be suited as a theoretical model for further analyses on the guidance, design and governance of e-government infrastructures. Practitioners might apply it as an analytical tool.

1. Introduction

“Who does better in e-government?” This question is iteratively being raised in cross-national benchmarking and so far has mainly been answered by comparing to what extent and in what way governments offer online services to businesses and citizens [1]. This focus corresponds to a customer centric view on e-government, stressing the commonly pursued goal of improving the way in which interactions and transactions with governments can be carried out. A second widely stressed purpose of e-government is to increase effectiveness and efficiency of service provision from a government internal point of view. However, it is only recently that indicators related to an assessment of this latter goal have been integrated to e-government benchmarks [2]. This corresponds to an emerging shift in perspectives – moving away from an external view on how governmental service provision presents itself to an internal view on how advancements are accomplished and what is required in that respect. This shift may have been anticipated with a look at the often cited e-government maturity models (e.g. [3]).

Indeed, many countries have reached or are about to reach higher stages of e-government. Achieving even better services goes along with administrative transformation and requires inter-organizational cooperation. As e-government develops towards increased integration of services and functions – which is required for achieving more customer orientation – the technological and organizational complexity always increases as well [4], demanding higher flexibility on the side of administrations [5]. In other words, the more e-government evolves, the more important is the performance at the back-end [4], “A poorly designed infrastructure can block interoperability and severely hinder the migration towards e-government.” [6]. This particularly holds true for vertical integration of e-government services across administrative levels. In European countries, the usage of core basic services (e.g. e-identity, e-payment) substantially differs across government levels, with local governments lagging behind. This not only constrains customer centric service provision, but also weakens the business case for investing in the back-end of e-government since economies of scale cannot be fully realized [2]. Thus the maturity of the infrastructure is key to future progress of e-government. Yet, research on the guidance, design and governance of e-government infrastructures is rather scarce [7], [8].

The present paper deals with these issues. It thereby focuses on the interplay between the
organizational dimension of e-government and the development of national e-government infrastructures. The paper is structured as follows: First, we provide an overview to available literature in the field of e-government infrastructures. The focus is on clarifying the notion itself, its interrelations to e-government development at large and specific characteristics of supporting infrastructures. Second, we present the mandated project on which this paper is based, setting out the adopted research approach. Third, we present the main findings of the project: The context, development and current challenges of Swiss e-government are presented and compared to approaches of infrastructure development in other countries. Based on this, we elaborate a framework for re-organizing the institutional structures in Swiss e-government. Finally, we conclude with a discussion of the practicability of the framework and set out future research questions.

2. E-government infrastructures

A common goal of e-government is to provide better services more efficiently. Efficiency gains can be achieved through reuse of basic services and through simplification and standardization of the processes underlying the services. The concept of a national e-government infrastructure is closely interrelated to such endeavors. Infrastructure development touches upon a range of issues that are of interest to other research domains in e-government (cf. [9], [10]).

E-government infrastructures are increasingly aimed at not only providing interconnectivity, but generic functionalities that can be used as shared services by a range of agencies on different levels of administration. The idea is that governments use available basic services or building blocks for creating their own systems and services, thus reducing the costs of development and maintenance, stimulating standardization of services and fostering interoperability [7], [6]. It depends on the country specific set-up of e-government development how national infrastructures are developed (e.g. centrally vs. decentralized), how they are made available (e.g. government cloud), how they are used, and to what extent they contribute to reaching integrated service provision. Aagesen et al. have developed a framework for comparing infrastructure development across countries (cf. figure 1) that is useful for providing an overview to common interrelations in that respect [7].

The top layer of the framework relates to the political dimension of e-government. E-government development usually is or should be directed on the basis of a set of common policies. Thereby, it must be noted that within government, policies may take on different directions across state levels and that pattern-dependencies caused by previous policies may influence implementation. From an international comparative perspective, e-government policies should conform to and are likely to be influenced by constitutional principles (e.g. federalism, cf. [9], [11]).

The middle layer of the framework relates to the back-end of e-government and sets out the interrelations between governance structures, e-government architectures and generic infrastructures that are considered to be influential in the outcome of e-government development.

According to Aagesen et al., governance can be understood as an administrative interpretation of policies in the form of instructions, allocations of responsibilities and tasks of government agencies and thus relates to the managerial requirements in policy implementation. Architecture methods, guidelines and standards are made available to public agencies in order to guide and control action in accordance to the defined objectives and to support adherence of tasks and responsibilities. Architectures in particular, are considered as an instrument for overcoming a state of “isolated islands of technology”, i.e. fragmented and unrelated applications that overlap in function and content, by ensuring coordination. Similarly, infrastructure components can be provided for shared usage in order to support various government agencies’ ability to deliver their services effectively and to support interoperability. As with policies, infrastructure development is path-dependent in nature, i.e. past decisions limit the choice of options for future infrastructure development [1]. The framework has been developed with a view to “the tensions between central and decentralized actions and the use of architecture to develop the e-government infrastructure” [7]. It distinguishes between two types
of public agencies. Agencies that are operating at a regional or municipal level are considered to have limited policy domain. Agencies operating at a national level are assumed to take over a coordinating function and to develop and provide services centrally, while potentially also being consumers of shared services and components.

The bottom layer relates to the front-end of e-government, focusing on the service interaction between citizens, businesses and government agencies.

Our research interests relate to the middle layer of the framework and to two of five proposed foci of investigation: Examining service interaction, assessing the availability of infrastructure components or clarifying the role of IT and process architectures for guiding e-government development is not at the core of this paper. Rather, we focus on how governance of e-government is organized (organizational readiness), what roles different types of public agencies play towards establishing a national e-government infrastructure and how this process is governed and supported (use and adoption). In that we follow other researchers’ claim to conceptualize the back-end of e-government as socio-technological system in which infrastructural and organizational elements are intertwined ([11], [8], [12]). According to this understanding, infrastructures “emerge and evolve through the interplay of technology, users, and policymakers” [13].

Countries develop their e-government infrastructures in different ways. Until now, there is “still limited knowledge about strategies to guide infrastructure development and which functions and services should be part of the infrastructure” [8]. Following Janssen, a national infrastructure generally comprises “applications for processing information, databases for storing information, connections among these components and the network transporting information” [1]. They can be considered as constituents of a structure that is used by various organizations to enable interoperability, i.e. the ability of different systems and organizations to work together [8]. In its assessment of European countries’ back office readiness, the European e-government benchmark measures the existence of several specific back office building blocks (horizontal enablers). The listed services can be considered as common components of an infrastructure. These include services for e-payment, e-identity and single sign on solutions (processing), authentic sources such as registries or an e-safe solution (storing), open and possibly standard specifications (connecting) as well as a solution for secure e-delivery (transporting) [2]. In addition, the benchmark also assesses enablers that rather relate to the organizational requirements in the development of infrastructures, including architecture guidelines and catalogues of existing enablers. This confirms the finding that governance aspects increasingly receive attention and are considered to compliment government architecture efforts [8].

With respect to governance, it is important to point to some general characteristics of infrastructure development as identified by Janssen et al. [13]. Infrastructures typically evolve over time and adapt to new situations. In many cases, there is no central authority in charge of developing infrastructures. Rather, governance of infrastructures is carried out by networks of organizations and follows the principles of mutual understanding, goodwill and trust. Infrastructures are usually not designed from scratch, but entail both deliberately designed and emerging parts. Infrastructures adapt to changes in their environment by enabling the development of new services, which in turn influence the way they are used. Their purposes as well as their use may change over time. Infrastructures typically need a critical mass of usually different users. And, infrastructures may not only be used for different purposes but also the types of users may evolve over time, leading to further adaptations and re-organization. Establishing a national e-government infrastructure is therefore not an easy task and meets similar challenges and constraints [6] as identified for e-government integration and interoperability at large (cf. [9], [14], [10]).

Within the range of issues that should be addressed in practice when striving for an integrated and interoperable e-government [9] we are particularly interested in gaining a better understanding of how countries establish governance foundations and economic foundations (funding) with regard to developing a national e-government infrastructure across various governmental levels. Other dimensions such as the legal and policy foundations, intra- and inter-organizational premises and requirements or technology requirements and standards are only dealt with at an abstract level. In accordance with the framework presented above, governance foundations relate to questions of what kind of instructions guide infrastructure development, how responsibilities are allocated and agreed upon and how decision-making is formalized. This is challenging because, in “most cases, managing an infrastructure transcends the boundaries of centralized, hierarchical control of individual resources. Infrastructures are typically owned and operated by multiple parties working together and often users are important stakeholders who influence the development of the infrastructure.” [13]. Economic foundations relate to the question of how long-term funding can be ensured and how typical cost constraints can be overcome. In cooperative
settings these include resolving potentially unbeneficial distributions of costs and benefits, the availability of funds and unexpected budget constraints (cf. [9]). With regard to the provision and use of services provided by the national infrastructure one of the requirements relating to both a governance and economic dimension is to agree on sustainable business models (cf. [7]) that meet the evolving nature of infrastructures.

3. Research approach

The considerations presented here are based on a mandated project on behalf of the Swiss Federal Office of Justice that was carried out in 2011/2012. The objective of the study [15] was to clarify the benefits of a national e-government infrastructure in Switzerland and how it could be implemented in a federal environment from an organizational viewpoint. The report focuses on four key issues: 1. What is the position of Switzerland's e-government against the background of current strategy objectives and vis-à-vis the concept of a “public networked administration” [16]? 2. Can a need for action be derived from the current situation and the defined objectives? 3. How do other countries organize infrastructure development and what conclusions can be drawn from this with regard to Switzerland? 4. What kind of approach might enable Switzerland's e-government to utilize the potential of networked administration from an institutional and organizational viewpoint?

The analysis of the current situation of Swiss e-government is based on an in-depth analysis of strategies and agreements, on available controlling reports from the Programme Office eGovernment Switzerland (e.g. [17], [18], [19], [20]) and a survey among e-government officials from 2010 [21]. The focus of investigation is on policy development, governance and the identification of recurrent obstacles for infrastructure and interoperability development and not on a detailed assessment of which specific shared services are provided and used. Furthermore, 13 semi-structured interviews with Swiss e-Government officials and experts from all federal levels have been conducted in order to get an insight to their assessment of the following aspects: potential of an integrated government, organizational requirements for achieving it, state and pace of development, challenges and potential drivers. From the data we derived more detailed categories of analysis and clustered the statements accordingly. In this paper, we structure our findings as sets of core challenges. Interviewees were also asked to state their opinion on the idea of altering the existing institutional setting with the aim of opening up new opportunities for financing and operating national infrastructures. Based on these findings, we derive a set of requirements that an institutional re-organization should take into account.

The selection of countries for the comparative approach was led by the following considerations. Analysis should include states with economic and social levels of development comparable to Switzerland, states with diverse political systems (federal states vs. centralized states), states of differing scales (political entities), neighboring countries, European and non-European federal states. Comparison includes two European and one North American federal state (Austria, Germany, Canada) and three European central states (France, Sweden, Norway). The number of national tiers and according entities can be seen in table 1 ([22][23]).

Table 1. National tiers in compared countries

<table>
<thead>
<tr>
<th>DE</th>
<th>FR</th>
<th>NO</th>
<th>AT</th>
<th>SE</th>
<th>CH</th>
<th>CAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of tiers</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2d tier</td>
<td>16</td>
<td>26</td>
<td>19</td>
<td>9</td>
<td>21</td>
<td>26</td>
</tr>
<tr>
<td>3d tier</td>
<td>439</td>
<td>96</td>
<td>435</td>
<td>101</td>
<td>290</td>
<td>2763</td>
</tr>
<tr>
<td>4th tier</td>
<td>12239</td>
<td>36569</td>
<td>2357</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DE: Germany, FR: France, NO: Norway, AT: Austria, SE: Sweden, CH: Switzerland, CAN: Canada

Within the scope of the project it was not possible to conduct an in-depth analysis of the policy development and governance structure for each country. For an initial overview of the selected European country’s constitutional setting, strategic orientation, e-government organizations and governance structures, legal conditions and major e-government infrastructures we drew on available country factsheets and reports provided by the European Commission’s ePractice portal [24], and by the Assembly of European Regions (AER) [25]. According documentation for Canada is only partly available [23]. It must be noted however that the factsheets do not lay any claim to completeness or accuracy and that the considered aspects in the AER reports are discussed at the differing levels of detail. Comprehensive and coherent analyses of how e-government is organized across different countries are scarce and rather focus on few countries. Comparative analyses of the state of e-government in a given country are provided by various benchmarks. A brief comparison of the surveys provided by the European Union and the United Nations revealed that scores for single selected countries may differ considerably, depending on an assessed area (front-end vs. back-end), a given stage of development and the considered benchmark. We therefore do not assume that any one of the countries considered in the analysis might have, a priori, an especially exemplary character. Our comparative analysis primarily relies on six interviews with the departments responsible for e-Government at the national level. The primary purpose of the
interviews was to roughly categorize the structural conditions for the development of e-Government infrastructures and derive insights in relation to the situation in Switzerland. The emphasis was a) on the institutional setting (organizations and governance) of a national infrastructure, in particular the responsibilities for initialization, development, implementation and operation of basic services, on b) coordinative endeavors in that respect and c) financial models for operation, maintenance and development of a common infrastructure. For each country, we compiled a brief report of our findings [15] and deduced implications for the Swiss situation. For the purposes of this paper we present our main findings on an abstracted level.

Due to restricted reliability of the available reports, the rather small sample of countries and interviews from a national perspective only, our analysis is explorative in nature [27].

4. Results

4.1 Constitutional and Institutional Setting of Swiss E-Government

Switzerland is the most decentralized country in Europe [22]. Its constitution grants the 26 cantons (federal states) competences in a range of significant policy areas and some 2’500 municipalities perform a range of tasks autonomously. It was an early understanding that the systematic implementation of e-government, and thus the fulfillment of various preconditions relating to commonly available infrastructure, would call for close cooperation between all public actors. However, because of the constitutional setting, e-government is directed by policies from both federal levels and developed rather autonomously on the different national tiers. At the federal level, the responsibility for establishing the preconditions for an integrated e-government has been assigned to various departments and administrative authorities over the course of time. In parallel, the cantons started to develop their own e-government systems. A first assessment of e-government development in 2005 revealed that the complexity of establishing the electronic administration had clearly been underestimated and that more coordination among projects and across national tiers was needed [18]. Consequently, in 2007 the Swiss Federal Council adopted a genuine national e-government strategy, serving to establish common goals and calling for cooperation across all federal levels, so that synergies could be utilized, efficiency increased and better services created. Additional measures came in the form of institutionalizing a Swiss coordinative organization, an e-government cooperation agreement between the federation and the cantons, and the definition of prioritized projects as instruments for implementation [19]. The latter are considered the main driving force in Swiss e-government and include a range of issues like specific services, prerequisites needed for developing further services, guidelines and architecture methods. Project leader organizations – typically federal agencies, inter-cantonal organizations and associations – are responsible for setting up project specific organizations and securing the funding. First joint funds have only been granted for selected projects in the context of the 2011 renewed framework agreement. The national Steering Committee and the Programme Office eGovernment Switzerland as main strategic and coordinative bodies supervise and assist the leading organizations. The institutional landscape is complemented by the national standardization organization eCH. Established by stakeholders from government agencies across all federal levels, business partners, and academia, this association has become an essential player in Swiss e-government. It is further supported by the Swiss Conference on IT, an inter-cantonal organization also active in the creation of technical (and semantic) standards, as well as in coordination across national tiers. The Cantonal Director’s Conference recently established an inter-cantonal group of e-government officials that is primarily aimed at institutionalizing an increased information exchange. On the municipal level, existing unions of the cities and communities deal with e-government issues; however these unions have no representative power.

4.2. Current Challenges of e-Government Development in Switzerland

Our assessment of the current situation revealed the following major challenges for e-government development:

Evolutionary logic: The decentralized approach that is still favored today has its own set of problems. First, it has led to a heterogeneous landscape of solutions. Although e-Government services that support electronic transactions with administrative authorities are available, the extent of availability differs from service to service and from canton to canton. Development as a whole is beginning to stagnate, and there is still a tendency to develop isolated or parallel solutions. Coordination across national tiers is therefore needed, but difficult. Coordination was traditionally based on the principle of voluntary engagement. A tendency towards greater commitment in the form of binding agreements has only recently become more discernible. Second, the
decentralized approach poses problems for setting up functional cooperation, since this requires new organizational arrangements that allow for defining governance structures across organizational boundaries. However, budgeting regulations in administration make it difficult to develop sustainable joint funding schemes (see below). The fragmented landscape of e-government solutions and signs of stagnation are also a result of shortcomings with regard to infrastructure development. Although a range of elements required to achieve a networked administration are now available, various important preconditions are still not in place. Meanwhile, new issues that should be addressed from a national perspective are finding their way onto the agenda (e.g. government cloud, open government data). The lack of progress regarding development of generic services and nationally binding regulations is resulting a) in the creation of new insular solutions and heterogeneous legal frameworks at subordinate federal levels and b) in a wait-and-see attitude. In turn, insular solutions prove a hindrance to agreement on shared solutions in the future. The general view is that e-Government needs to be jointly developed; however, not all stakeholders recognize the urgency with which existing problems need to be eliminated. Cultural factors, such as the tradition of seeing matters in terms of autonomous, clearly defined areas of administrative responsibility, are obstructing the development of a networked administration.

**Governance:** In the current situation the main responsibility for implementing the Swiss e-government strategy lies with subordinate federal tiers. This makes it extremely difficult to adopt a systemic approach to challenges of super-regional significance to e-government. Often it is unclear who should and can provide basic services for joint use. Responsibility for developing parts of a national e-government infrastructure is allocated to diverse and sometimes changing leading organizations. If set up as joint projects, they encounter the same difficulties establishing new organizational arrangements as any cooperative setting. Accordingly, infrastructure projects are often encumbered by unresolved financing issues and unsustainable long term operation. Against this background there is some desire for a more centralized leadership, which is mainly associated with a stronger engagement of the federal state. In the current institutional setting, several organizations take over tasks related to standardization and coordination. eCH has established itself as national standardization organization and takes over this role with limited resources. The implementation of standards is however still not mandatory. The responsibility for ensuring that standards are applied has not been defined or is left to the discretion of the cantons and municipalities. The Programme Office eGovernment Switzerland assumes the role of a national coordinative organization. In accordance to its limited capacity it engages in an exchange with other coordinative organizations. These certainly contribute to an exchange of information on e-government development in the country, yet there is a clear need for further networking across all federal tiers and for better integrating the municipalities. Coordination and collaboration are costly, yet the available resources are generally inadequate. In the current organizational setting two aspects that play a role for achieving integrated e-government across national tiers are not supported institutionally. First, there is no organization in the legal sector designed to address issues of legislative enactment in relation to e-government. Second, there is no national organization appointed to deal with issues relating to financing and in particular the operation of basic infrastructures across national tiers.

*Development and operation of a national e-government infrastructure:* There is no consistent understanding of what a national e-government infrastructure is or should be. Notions as to which basic services should be commonly available, i.e., provided by some sort of a central source, are largely based on the existence or lack of implemented solutions. As is the case for strategic development, infrastructure development is equally path-dependent. By limiting the set of options, decisions made in the past influence decisions made today. The issue of financing e-government, and in particular its basic infrastructures and projects with a prerequisite character (e.g. standards), is generally unresolved and represents one of the greatest challenges. Infrastructure development often requires large investments, while benefits are generated for a variety of (potential) users. Single government agencies often cannot bear the investments on their own. A cooperative approach however generates considerable transaction costs: in order to leverage investments, cooperation needs to be regulated, potentially differing financing procedures aligned, responsibility for implementing the project defined, the allocation of costs regulated, and sustainable business models elaborated. This latter question also needs to be tackled, even if a government agency can bear the costs alone. Swiss administrations are not particularly competent in the role of service providers for other agencies, since their entrepreneurial scope of action is limited. Operational issues relating to existing or future developments are therefore often inadequately clarified. A lack of sustainable operation concepts leads to planning uncertainty for existing and potential co-users, slowing down the development of e-government at large.
4.3. Lessons Learned from Other Countries

In Switzerland, federalism is not only a guiding principle of e-government, but also serves as an explanation, if progress lags behind expectations. It is assumed that implementation across national tiers would be much easier in centralized settings and that certain difficulties would not present themselves. The comparison with countries abroad shows that this argument is specious.

Based on the interviews with e-government officials abroad we find that not only major challenges, but also the strategies as to how best face them are rather similar. Political system and constitutional setting: Irrespective of a given political system, administrative modernization appears to be at a similar stage of development in the various countries. Neither do the number of governmental tiers nor the number of political entities (regions, municipalities, etc.) seem to have any significant impact on the challenges facing e-government and the approaches to finding solutions. Of significance is the allocation of competence among administrative tiers, particularly regarding financial autonomy. The more complex the allocation of competences, the more complicated the solution-finding will be. Underlying legal frameworks: There are marked differences in the configuration of the underlying legal frameworks. Many countries face difficulties in establishing legal interoperability. To what extent these challenges particularly relate to the allocation of competences requires further examination. Where they occur, it is advisable to undertake a status analysis of legal frameworks as they apply to e-government. Institutional and organizational setting: The organizational landscape surrounding e-government has changed significantly in all surveyed countries over the past five years. In particular, cooperation is noticeably more institutionalized. Austria has assumed a pioneering role in this regard. However, all of the countries are meanwhile aligning their processes, regulations and organizations with the objective of creating a networked administration. Enforcement in the sense of top-down competence is not strictly necessary. Even centralized states appear to base their search for solutions on cooperative considerations, despite the fact that they have far-reaching competences at national level. Coordination and Cooperation: A common and also the greatest challenge lies in achieving coordination within and between tiers. The large number of players involved in e-government increases transaction costs for both problem identification and decision-making. This issue is particularly apparent at local administration level. Some countries have tackled this by establishing competent agencies equipped with decision-making powers and actively integrating them in the design of e-government. Funding, operating & maintaining e-government infrastructures: In most countries, the national e-government infrastructure appears to be developed centrally, i.e. primarily at national state level and financed accordingly through existing structures. The problem of annual budget procedures represents an obstacle for realization, operation and maintenance of long-term e-government solutions. Some countries have deliberately explored possibilities of how to overcome this problem and adjusted budgetary regulations to better meet the needs of e-government. The development of operational and transaction models for shared infrastructures represents a considerable challenge. It is advisable to find solutions to these questions before implementing a shared service. Some countries have by now established funding keys across national tiers that can be replicated as new issues arise.

Our overall assessment of the international comparison is that a reassessment of the current institutional setting of Swiss e-government seems promising. Despite the differences in political systems, parameters of size and other fundamental conditions, there is a range of approaches available that could be adapted to Switzerland's situation.

4.4. Towards a Potential Re-organization of the Swiss Institutional Setting

A re-organization of the Swiss institutional setting would have to pursue clear goals. The key question is: Can we address the challenges identified in 4.2 by altering the current institutional structures? Can we in particular solve the problems of redundant innovation through the creation of a new organization that contributes to clarifying governance structures in e-government? Any practically relevant answer to this question must take into account existing realities and must meet a range of requirements. The current standardization organization eCH is based on private-public-academic collaboration. It is widely accepted among all e-government stakeholders and performs its tasks satisfactorily. There is no apparent necessity for a change here. While there is room for further consolidation and enablement of existing coordinative organizations (required resources), we perceive the most pressing change in the area of implementation and in particular in the provision and usage of shared services.

We propose to adapt the existing institutional structures by complementing them with an executive organization assigned the responsibilities of ensuring funding, sustainable operation, maintenance and
further development of infrastructures within and especially across national tiers (see figure 2). The main idea is to nationally institutionalize central functions on the strategic, the normative and newly on the operative level of e-government. We conceive this new organization as a service provider with an organizational structure outside the administration. Agencies from all national tiers could mandate the organization on implementation of infrastructure projects or the operation of already existing solutions. This does not mean that the organization must, or even should, operationally provide the services itself. In the sense of broker, it can also procure them from existing or new infrastructure service providers in government and in industry. Adherence to existing standards would be a mandatory prerequisite for subcontracting.

The idea that mandating is open to different constellations of governments and covers different types of tasks is a core element of the envisaged solution. Thus, the pursued outcome is not primarily related to a centralization of infrastructure development, but rather focuses on a flexibilization of funding schemes and business models. If this can be achieved, such an organization could substantially contribute to enhancing cooperation among diverse government agencies and foster integration across federal tiers. To this end, the organization would have to be creditworthy and able to manage its resources with business opportunity. The possibility of establishing provisions for maintenance and further development of basic services – which in the given administrative structures is not possible – would accelerate innovation. If the organization receives sufficient uptake, by governmental clients, innovation will more likely take place only once rather than multiple times – as is the case today.

In order to institutionalize cross-organizational cooperation in the financial and operational area, such an executive organization would have to meet the following requirements: Strategic alignment: the organization must contribute to implementing existing strategies and regulations in the context of e-government. This includes alignment with the existing organizational structure. Ownership: we assume that private ownership is less suitable than public ownership, due to legal implications regarding handling and control of sensitive applications and data by private organizations. The organization must be trustworthy and accepted by government agencies. Shared ownership across national tiers is presumably best suited for developing common and sustainable solutions through a cooperative approach, in which all stakeholders have their say. This is important to gain political support in the first place. Governance: clear governance structures are a prerequisite for establishing trust and will be of central importance when setting up a nationally operative executive organization. This includes clarifying its role and tasks – also vis-à-vis other organizations in order to grant knowledge exchange – and establishing sustainable decision-making mechanisms: e.g. with regard to identifying potential developers and operators as well as potential co-users or with regard to defining requirements towards initializing a project in the first place (e.g. critical mass of users). Economic considerations should serve as a principle for decision-making. In order to ensure long-term cooperation and thus planning certainty, its clients would need to make certain commitments, while the organization needs to ensure client-orientation. Competences: the organization must ensure economic skills, both operational and managerial ones. Due to the evolutionary nature of infrastructures it must develop adequate funding and business models and needs to define rules of how governments may opt-in and opt-out in order to balance investments and benefits. Furthermore, it will have to regulate inter-organizational arrangements. In the context of e-government a basic understanding of political, legal, or technical issues is indispensable. Legal form: the main added value of an executive organization is that it allows for reallocating investments through user fees. As mentioned already the organization therefore needs to be creditworthy and be able to manage its resources flexibly (e.g. transfer of funds beyond budget periods). Conversely, some kind of supervision would have to be installed. Funding: the organization should primarily finance itself through self-sustaining projects, i.e. through remuneration of development and operation costs (lump-sum and/or usage dependent fees), which need to be regulated with its clients. Some initial
funding would probably be required. The allocation of costs between governments requires elaborating solid funding keys (small vs. large cantons).

We proposed the idea to e-government experts across national tiers, deliberately leaving open specifications such as the legal form of the organization, its governance structures or its funding in order to derive requirements for further design, assuming that a certain vagueness leaves room for a participatory approach and helps gaining political support. This assumption was proven right in the interviews. While some e-government experts have pursued a similar line of thinking themselves, the idea of institutionalizing a national implementation organization initially puzzled most of the interviewees. When digging deeper into the matter, we found however that there is a demand for institutionalizing such a nationally operating organization. A substantial interest in mandating such a service provider is most notable regarding shared services that have not been developed yet, in areas in which cooperation is desirable, but has not been set up yet and in situations, in which current administrative structures (budget regulations) pose an obstacle for sustainable operation of existing solutions or where the operation lies beyond the scope of a government agency’s mandate.

5. Conclusions

Switzerland is a highly decentralized country. This is particularly true for the implementation of e-government services. Insufficient coordination has resulted in a problematic proliferation of e-government solutions and a heterogeneous organizational landscape with fuzzy governance structures. Achieving integration and interoperability was and is challenging. Severe shortcomings regarding guidance and enablement of infrastructure development clearly have accentuated the current situation. Implementation costs for developing basic services cooperatively are high. For both, governmental providers and users of common infrastructures unsustainable funding and operating models are core problems. If further fragmentation is to be avoided and if the pace of development is to be accelerated, organizational foundations must be strengthened.

Our comparison with other countries – centralized and decentralized ones – has shown that current challenges are largely comparable. Notwithstanding different political, legal or institutional settings, and differing evolutionary paths, none of the countries, including Switzerland, can be seen as an extraordinary special case. A cooperative approach aimed at inclusion of many if not all stakeholders from all national tiers seems the most promising way to ensure that a national e-government infrastructure is set up according to their needs, remains interoperable and reusable, and is financially sustainable.

We conclude for Switzerland that an institutional re-organization should strongly be taken into consideration. It would have to ensure that coordination, standardization and implementation are supported in the best possible way. Besides consolidating coordinative organizations, we consider the idea of institutionalizing a nationally operating executive organization as highly promising. The main advantages are: a) enhancing financial and operative cooperation within and across administrative levels by overcoming budgetary constraints, b) extending business opportunity and establish provisions for maintenance and further development of basic services, c) accounting for evolutionary development of e-government infrastructures by providing sustainable financing and operating models and by offering services for which there is a demand d) preserving competition on the market (governmental and business providers) by acting as a broker, e) fostering standardization by declaring mandatory adherence to standards. The envisaged organizational structure would/will be crucial for implementing the Swiss e-government architecture presently under development and for realizing significant forthcoming infrastructure projects, such as the Swiss e-government cloud in particular.

The solution drafted in this paper is currently being evaluated at the federal state level. It has stimulated discussion among e-government experts across federal levels and is debated in the inter-cantonal IT-commission. The suggested approach is deliberately conceived on a rather abstract level and requires further development. This includes addressing further questions regarding legal conditions, institutional and organizational design, and the financing models. The purpose behind this is to enable a participatory design. A possible implementation will require the consent of many stakeholders. In the Swiss federal setting, political acceptance can only be achieved by a stepwise specification of the organizational details. In this process, stakeholders across federal levels must be involved. If complete solutions were presented at the beginning, however brilliant they might be, the sum of details would obscure the vision and most likely provoke opposition.

The interrelations regarding governance and economic foundation of infrastructure development deserve closer examination. Further research is needed to provide deeper insight on how the allocation of competences, legal self-determination and financial systems across state levels influence the complexity of solution-finding in e-government. The proposed
framework can be used to guide analysis – for researchers as well as for practitioners, within and outside Switzerland.

6. References