TOWARDS STAKEHOLDER GOVERNANCE ON LARGE E-GOVERNMENT PLATFORMS - A CASE OF SUOMI.FI

Research paper

Päivärinta, Tero, University of Oulu, M3S, Oulu, Finland, tero.paivarinta@oulu.fi, on leave from Luleå University of Technology, Luleå, Sweden, tero.paivarinta@ltu.se

Smolander, Kari, LUT University, School of Engineering Science, Lappeenranta, Finland, kari.smolander@lut.fi

Yli-Huumo, Jesse, Population Register Centre, Helsinki, Finland, jesse.yli-huumo@vrk.fi

Abstract

E-government evolves towards large-scale software platforms that integrate access to and information exchange among public services. Governance of large-scale e-government platforms is challenging because of the large number of stakeholders with diverging needs, agendas, and changing service portfolios. This paper presents a revelatory case, the e-government platform Suomi.fi, its stakeholders and stakeholder interactions related to development and governance of the platform. Our stakeholder analysis of Suomi.fi identified 15 stakeholder interaction types and related issues regarded as important for governance of large-scale e-government platforms. The results contribute by addressing the importance of stakeholder identification and continuing governance beyond individual development and implementation projects. Such a large-scale platform involved additional stakeholder types of external influencers (including media, other countries, the European Union, third party software integrators) and other external platforms, compared to the project-centric stakeholder models. Hence, we argue for extended stakeholder governance models and practices for large-scale e-government platforms.

Keywords: E-government, Platform, Stakeholder Governance.

1 Introduction

Development of e-government solutions has been regarded as a challenging issue throughout the recent decades (Heeks, 2003; Dada, 2006; Anthopoulos *et al.*, 2016). E-government projects often involve a variety of stakeholders (Scholl, 2001; Flak and Rose, 2005) such as government offices, local public organizations (e.g. cities, municipalities, hospitals, schools), citizens, private businesses, and third sector organizations. These stakeholders interact with each other with varying agendas in mind, which poses challenges for managing the development projects (Greger *et al.*, 2014). A recent research and development stream regarding e-government as platform (Anthes, 2015; Yli-Huumo *et al.*, 2018) introduces new challenges to the management and governance of stakeholders beyond the scopes of individual projects. A platform is a connection point, where varying stakeholders, their services, and the users meet. It is often not possible to predict the full service portfolio or even the full set of stakeholders of a platform beforehand. Instead, the services and stakeholders evolve over time when new uses and services are invented and introduced.

Gawer & Cusumano (2014) define an internal platform as a set of assets organized as a common structure on which an organization can efficiently develop and produce a stream of derivative products or services. An e-government platform is an internal platform when available only to branches of administration. The concept of external platform (Gawer and Cusumano, 2014) refers to assets organized in a common structure upon which external innovators can develop their own complementary products, technologies, or services. Our case describes an external e-government platform, on which such stakeholders related to public services as administrative branches, government offices, municipalities, associations, NGOs, and private companies can connect to and offer their services.

Understanding of e-government stakeholders can provide important knowledge for development, improvement and governance (Flak and Rose, 2005). This research studies a recent large-scale, national e-government platform implementation and adoption in Finland. The KaPa development program (in Finnish: Kansallinen Palveluarkkitehtuuri, national service architecture) was launched by the Government of Finland to create a national platform for digital services in Finland. The resulting service platform, Suomi.fi, provides a one-stop view for citizens to access public services. The KaPa program is a unique and large e-government implementation project, involving many stakeholders (such as public organizations, private businesses, third party organizations, citizens (both Finnish and EU citizens), governmental branches, cities, municipalities etc.). This recently initiated platform and development program provided a rare opportunity to study and identify stakeholders included in an e-government platform and understand the interactions between them. In this study, we have the following research question: "What kind of governance-related stakeholder interactions take place on an e-government platform?"

2 Background

E-government as platform. Success in most activities is dependent on the ability to utilize both new technology and its social capacities. The current dominant way to organize this combination of the technology and the social is to build software-based platforms in the Internet. Examples include flexible services that are used for social interaction (e.g. Facebook, Twitter), commerce (e.g. Amazon, Alibaba), or information and services related to special interests of people (e.g. Tripadvisor, Reverb.com). There is a growing interest also in the Academia on software-based platforms (Gawer and Cusumano, 2008, 2014; Boudreau and Hagiu, 2009; Venkatraman *et al.*, 2014) or platform economy (Kenney and Zysman, 2016) and much knowledge has been collected on platform ecosystems and their governance (Eisenmann *et al.*, 2006; Tiwana *et al.*, 2010; Evans and Gawer, 2016; Huber *et al.*, 2017). In the field of e-government, large-scale, national software platforms are under operation or development in a few countries, e.g., in Estonia (Anthes, 2015), Finland (Yli-Huumo *et al.*, 2018), and China (Hong *et al.*, 2018), where public organizations and (in some cases) private companies provide their services and data through the platforms.

E-government stakeholders. We use the definition by Freeman (1984, p. 46) for stakeholders as "any group or individual who can affect or is affected by the achievements of the organization's objectives". In their review of stakeholder theory in the e-government literature, Flak and Rose (2005) list several application areas for stakeholder identification and governance in the field of e-government. Of those, we adhere to the stance that understanding of stakeholder constellations and requirements is important for design, implementation, and continuing governance of complex public sector systems, involving several stakeholders. This stance motivates our research.

Several studies identify and classify stakeholders of e-government development and use. For example, Tan *et al.* (2005) studied stakeholders and their interest towards an e-filing system in Singapore. They identified five primary categories of stakeholders: Government, tax authority, tax officials, taxpayers and employers. The identified stakeholders exhibited different interests, which should be carefully taken into account in the e-government strategy. Chan *et al.* (2003) studied stakeholder relationships in a Singaporean eCitizen portal. They identified four types of stakeholders with different relationship dependencies: potential public users, dependent public users, dominant partners, and amiable partners. They claim that each stakeholders' interests and relationships need to be treated differently in e-government projects. Hughes *et al.* (2008) studied implementation of a citizen-centered e-government project in Ireland and concluded that the role of stakeholder involvement should be the key component of implementation strategy in e-government projects.

Flak *et al.* (2007) divided e-government stakeholders to two main entities: government and citizens (further divided into more specific subcategories). They identified interaction both within and between these two main entities. Fedorowicz *et al.* (2010) analyzed non-filer compliance system used by the California franchise tax board. They identified four main stakeholder categories, data controllers, data subjects, data providers, and secondary stakeholders. Johannessen *et al.* (2012) studied stakeholders

communication and expectation needs in eParticipation in a small Norwegian municipality. They identified stakeholder groups such as political, government administrator, and civil society.

Stakeholders of e-government development and implementation. Greger *et al.* (2014) share our interest on stakeholder identification for supporting design, implementation, and management of e-government projects. They suggested a stakeholder interaction model for e-government projects based on the phases of project lifecycle. The phases include assignment, design and implementation, and usage. The interaction model comprises five stakeholder categories divided into the lifecycle phases. In the assignment phase (1) Strategic project owners decide to conduct a project and commission it. In the design and implementation phase (2) Operative project owners implement the project and (3) Supporters help operating project owners by implementing and operating the e-government solution. Further, they also help the external users solving problems occurring during the usage of the e-government solution. In the usage phase, the stakeholders are (4) External users who do not belong to public administration and use the e-government solution, and (5) Internal users that interact with external users and receive the output of the e-government solution usage (see also Johannessen *et al.*, 2012). As our focus resides in understanding stakeholder roles in relation to design, implementation, and governance of the platforms, the project life-cycle phases by Greger *et al*. (2014) formed the first basis for stakeholder identification in our case, as well.

While Greger *et al.* (2014) have provided a summarizing model of stakeholders and their interactions in e-government development projects, implementing e-government as a platform extends beyond the scope of a project. A platform is not an entity with predefined functionality or particular end-user services. It evolves over time. After launch and first usage by the key actors, its development continues as all its uses and services are not necessarily known beforehand, and its integrations to other platforms, systems, organizations and users continue to evolve. Similarly, external connected platforms and systems evolve continuously in their respective business contexts. Continuous development of the e-government platform requires therefore careful and continuous governance or orchestration that has a balanced view on expectations of various stakeholders. Platforms cannot be managed in a goal-oriented way because the number of stakeholders and their relationships increase beyond the ability of what the platform owner can handle (Smedlund and Faghankhani, 2015). Platform orchestration and governance may solve this issue by continuously designing and facilitating processes between stakeholders.

Although many studies discuss e-government stakeholders and their classification, none of those we found took platforms and their stakeholders in consideration. E-government platforms have been mentioned in many places, such as in the editorial by Janssen and Estevez (2013), but their effect on e-government design, implementation, usage and maintenance has not been analyzed thoroughly. There we see that there is a need to build understanding of stakeholders in the context of a platform-based e-government implementation. This may offer better methods and practices for e-government platform design, implementation, and governance.

3 Research process

Case description. The KaPa program was started in 2014 by Government of Finland to develop a national architecture for digital services. The program was finished in 2017 and during the four years, the Suomi.fi service platform was developed. After KaPa, the new project is called SuoJa (in Finnish: Suomi.fi palveluiden jatkokehitys), the goal of which is to further improve and maintain the developed Suomi.fi platform and its services. It is important to distinguish that KaPa (in Finnish: Kansallinen Palveluarkkitehtuuri) is the name of the program and Suomi.fi is the name of the platform that was developed during the program. Our case study focuses on the KaPa program and Suomi.fi portal from the viewpoint of development and governance, as both the development program itself and the artefact resulting from it (Suomi.fi) involve several stakeholders whose needs and requirements need to be managed during and after the initial development program.

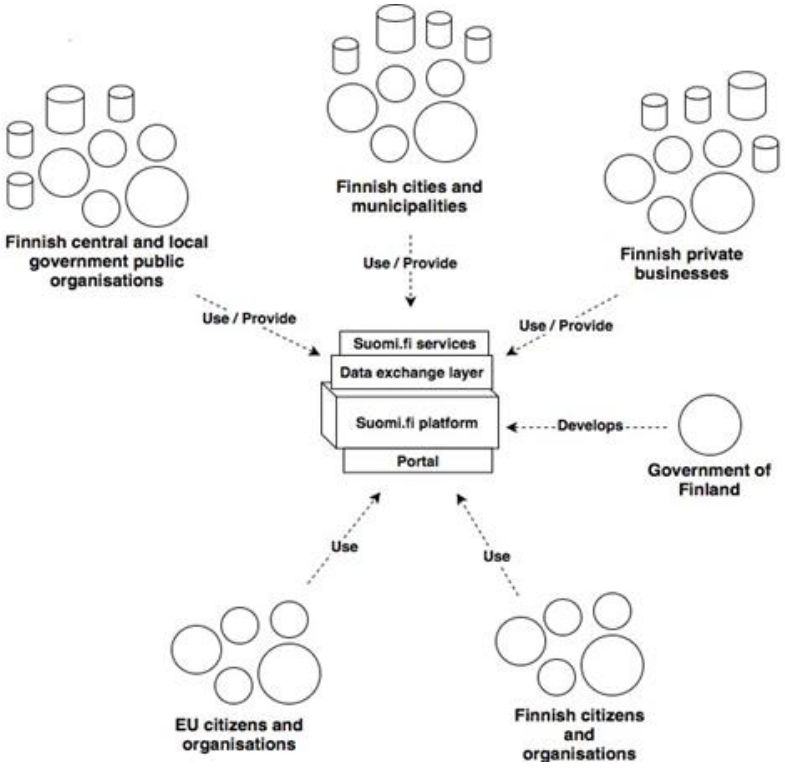

Figure 1. Suomi.fi service platform.

The KaPa program is a significant and rare case in the context of e-government. Government of Finland set a budget of 100 million euros to the program, of which 80 million euros was spent during the four years to complete the program that produced the platform and its services. The KaPa program and Suomi.fi service platform influences several organizations, businesses, and citizens in Finland and even in other European Union countries. Figure 1 presents an overview and shows the main stakeholders groups affected by the program and platform.

The Suomi.fi service platform can be divided into two main components: portal and services. The services in the platform can be seen from two perspectives. First, there are the services that are provided to the end users by the public sector, private sector and third sector organizations and businesses. Simply put, organizations and businesses can provide information of their own services and access to them through Suomi.fi platform for citizens and other organizations to use. In that sense, Suomi.fi platform operates as a central information ledger for citizens and organizations to acquire information related to daily life requisites. This information is accessed by the citizens and organizations through the Suomi.fi portal (www.suomi.fi). The portal is an access to one-stop service shop that citizens and organizations can use to access gradually all public sector and some private sector services and governmental requisites that are needed in Finland. As an example, a tax office offers services and information related to taxation in Finland; a private sector law business can provide services and information related to legal requisites; or a university from the third sector can provide information and services related to their studies and programs.

The second perspective to services consist of the Suomi.fi platform services that are targeted to public, private and third sector organizations and businesses in Finland. Suomi.fi consists eight platform-level services for businesses and organizations available for use. The services can be seen as additional building blocks to add in organizations and companies own systems. Some of the platform services are only available for public sector organizations. The platform services that are available only to the public sector or private sector service producers, are marked with *:

- **Data exchange layer:** enables standardized and secured data exchange between organizations (based on Estonia's x-Road technology). Businesses and organizations can share and use registries and databases.

- **E-identification*:** enables organizations to authenticate their service users with strong electronic authentications methods; a single sign-on for citizens, which provides access to all public sector services that use e-Identification.
- **E-authorization:** enables citizens or organizations to authorize another citizen or organization to act on behalf of them.
- **Service catalogue:** enables organizations to describe their services in a standard way to a common database.
- **Maps*:** service enables a centralized way for organizations and citizens to view and present locations.
- **Payments*:** enable public organizations to send invoices to citizens. Citizens can access payments through Web portal.
- **Messages*:** operated to serve citizens and organizations alike. Citizens can access messages through Web portal.
- **Web service (portal)*:** an integrated view on public services (combining all Suomi.fi services under one view). Organizations can provide registers of their web services that citizens can view through the portal.

Data collection. First, we conducted 11 semi-structured interviews with development stakeholders we had a contact with from before, such as the program managers of the KaPa program, the development team of Suomi.fi platform, public sector organizations, and private sector businesses. The purpose of this data collection round was to get an overall view of the program, platform and the challenges met. Second, we performed an online survey with Suomi.fi stakeholders about their experiences with the platform. We accessed a representative selection of important service providers, including municipalities, government offices and private providers. Third, we observed various stakeholders by participating into two KaPa program events. The first event was a presentation of online survey results to the Suomi.fi development organization about the experiences of user organizations of the Suomi.fi platform. The second event was a future roadmap presentation by the Suomi.fi development team to user organizations. As the last data collection method, we collected more than 300 news articles and blog posts discussing about Suomi.fi and the KaPa program as secondary data to find additional information about stakeholders and their possible interactions.

Data analysis. For data analysis, we recorded and transcribed all the data for qualitative analysis. Two researchers went through all the collected data to identify all the relevant stakeholders. Because the case is very extensive and covers the whole public administration in Finland, we did not consider at this stage the stakeholders any more as individuals, but roles or organizations. To combine these roles and organizations as a concept, we use the term stakeholder group. Actually, most informants in the study had multiple stakeholder roles. For example, they were all citizens and representatives of an organization. Since Suomi.fi was not in the adoption phase at the time of data collection, the analysis represents the development perspective.

We used the model by Greger *et al*. (2014) as the conceptual basis for stakeholder identification and relationship analysis. Greger *et al*. (2014) divide an e-government project to the phases of assignment, design and implementation, and usage, whereas the stakeholders are categorized to strategic project owners (initiating the assignment), operative project owners, supporters of design and implementation, and external and internal users. The data and stakeholder roles emerging from that were first related to the model of Greger *et al*. (2014). When a stakeholder was identified, we created a post-it note of the stakeholder in question. When we identified some type of relationship or interactions between the stakeholders related to governance of development and/or the platform, we marked connections with lines and explanations of them. On the basis of collected and analyzed information, we identified and categorized the stakeholders of Suomi.fi and interactions between them. The results were presented for the operative project owner, Population Register Centre (PRC), which confirmed the meaningfulness of the analysis.

4 Results

4.1 Identified stakeholders

We identified 17 main stakeholder groups that have a role in either the KaPa program, the SuoJa project or in Suomi.fi platform. The stakeholders are presented in Table 1. Government of Finland is the strategic project owner. As for operative project owners, we identified the responsibility of design and implementation to be assigned to Ministry of Finance and Population Register Centre. As for supporters, we identified Finnish Government IT Centre and 3rd Party Development Organizations.

Strategic project owners	
Government of Finland	The KaPa program was started by Government of Finland to improve national architecture for digital services.
Operative project owners	
Population Register Centre (PRC) (Platform orchestrator)	PRC is a Finnish government agency that provides demographic information services for Finnish citizens, public administrations, businesses and communities. PRC operates under Ministry of Finance in Finland. PRC is responsible for managing the development of Suomi.fi platform.
Ministry of Finance (MF) (Platform owner)	MF is one of the 12 ministries in the Finnish Government. MF is responsible for managing and leading the KaPa -program.
Supporters	
Finnish government ICT centre (Platform operator)	ICT Centre provides sector-independent ICT services for central government administration. It operates under the administrative purview of the Ministry of Finance. ICT Centre provides support to the technical development of Suomi.fi.
3rd party software and system development and consultancy companies	Software and system development and consultancy companies in Finland. These companies develop Suomi.fi platform as coordinated and resourced by PRC.
Service providers	
Public sector organizations	Government public sector includes state administration, universities, the Social Insurance Institution, the Bank of Finland and unincorporated central government enterprises. They offer their specific services on Suomi.fi platform.
Municipalities	Municipalities and joint municipal authorities include the municipal administration, the municipal school system, the unincorporated service institutions and agencies of the municipalities and joint municipal authorities, such as health centers, hospitals, day-care centers and unincorporated enterprises. They offer municipal services on Suomi.fi platform.
Private sector companies	The private sector companies that operate mainly in Finland. They use Suomi.fi platform to offer their specific services.
3rd Sector Organizations	The third sector operates in the duty of social activity undertaken by organizations that are not-for-profit and non-governmental. They use Suomi.fi platform to offer their specific services.
Legal entities that use services in Suomi.fi	
Citizens	Citizens of Finland and the EU and that want to use services in Suomi.fi platform.
Organizations and Companies	Organizations in Finland and the EU that want to use services in Suomi.fi platform.
External influencers for Suomi.fi development	
Government of Estonia	Government of Estonia is the legislative power in Estonia. Government of Estonia is carrying out e-Estonia program to improve digital services in Estonia.

European Union (EU)	EU is a political and economic union of 28 member states. EU has started a Digital Single Gateway strategy with objective to improve digitalization.
Republic of Estonian Information System Authority (RIA)	RIA is an Estonian government organization, which operates in development and administration of the national information systems. RIA is responsible for the development of x-Road, which is also used within Suomi.fi.
3rd party software and system integrator companies	Software and system development and consultancy companies that provide technical services for integration and use of Suomi.fi platform services.
Media	Media organizations that publish information about KaPa and Suomi.fi through magazines, newspapers, television, radio, internet and other means.
External platforms required by Suomi.fi	
Electronic identity platform (eID)	eID platform is one of the Strong Customer Authentication (SCA) methods available in Finland, which holds for more than 90% of all operations that require SCA. The majority of the citizens and companies that need to identify themselves in Suomi.fi are required to use the eID platform operated by Finnish banks. Suomi.fi developers had intensive negotiations with the eiID platform representatives.

Table 2. Stakeholder groups of KaPa program, SuoJa project and Suomi.fi service platform.

The original stakeholder interaction model by Greger *et al.* (2014) defined the usage stage to include external users and internal users. However, due to the platform nature of Suomi.fi, it was not possible to use the same categories, because, for example, there was a lack of a clear distinction between external and internal users. We decided to create two new categories called service providers and legal entities, which fit better to the context of the e-government platform. As for service providers, we identified Private Sector Companies, Public Sector Organizations, Third Sector Organizations and Municipalities. Service providers are external stakeholders in the platform that provide services for end-users that can be any legal entity, such as a citizen or an organization. Service providers can also use the platform services to increase both innovation and efficiency of their own systems and solutions. As for legal entities, the external "end users" of services provided by the service providers, we identified Citizens and Organizations and Companies.

We also identified two new external stakeholder categories that were not originally mentioned in the Greger *et al*. (2014) model: external influencers and external platforms. External influencers included European Union, Government of Estonia, Republic of Estonian Information System Authority, Media, and Third Party Software and System Integrator Companies and external platforms included an eID platform. The two new identified stakeholder categories do not explicitly take part in the e-government solution development lifecycle, its assignment, design, implementation or use, but can have important influence through other means. For example, Media influences stakeholders by providing information through mass media and the eID platform provides essential user identification components that are required in Suomi.fi platform.

4.2 Stakeholder mapping

As the second step, we mapped the identified stakeholders. We started our analysis with Greger *et al.* (2014) model that involves three phases of project lifecycle (assignment, design and implementation, and usage). However, we noticed rather soon that due to the complexity of the studied e-government platform solution, it was not possible to use the model as such. Figure 2 summarizes the stakeholder interaction model.

We created the following changes and additions to the initial model by Greger *et al.* (2014). First, we added external influence and external platforms as new layers in the model. As for stakeholders, we used some previously identified categories by Greger *et al*. (2014): strategic project owners, operative project owners, and supporters, but we added the new identified stakeholders service providers, legal entities, external influencers and external platforms (instead of previous categorization of internal and external users).

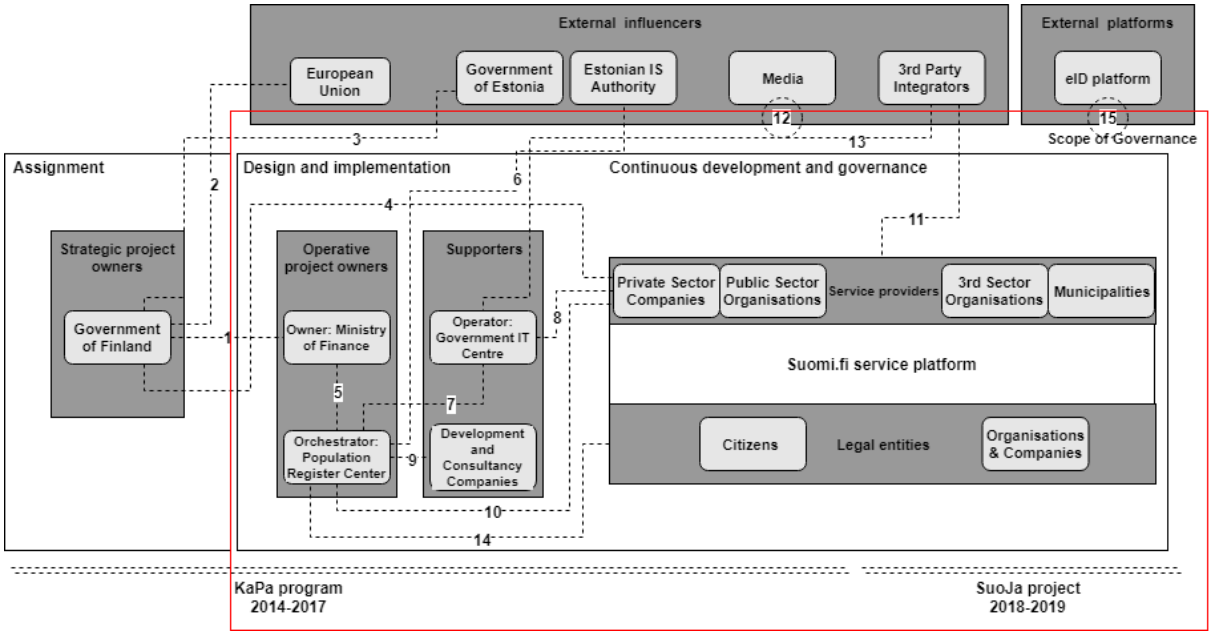

Figure 2. Stakeholder interaction model of Suomi.fi platform (Legend: the numbers of the identified stakeholder interactions are explained in Table 2 below, the rectangle around the phases of design and implementation, development and governance, and the most stakeholder interactions illustrates the scope of required governance).

Another important difference to the model by Greger *et al.* (2014) is the removal of the separation between the phases of design / implementation and use. Because Suomi.fi is a platform, it is often not possible to predict the full service portfolio, or even the full set of stakeholders of the platform, beforehand. Instead, the services and stakeholders evolve over time when new uses and services are introduced. Therefore, the Suomi.fi platform does not progress like a conventional e-government project with a clearly defined start and end, but it is in continuous evolution, without a clear finish to the platform development. Therefore, we consider the design, implementation, use, and, a new phase, continuous development and governance, to be happening continually.

4.3 Identified interaction types and governance issues

In Figure 2, we also mapped the interactions between the stakeholders. We identified total of 15 governance-related interactions between stakeholders. The interactions, their types and related governance actions and issues are described in Table 2.

5 Discussion

Unlike in the stakeholder models for e-government projects that focus on assignment, design, implementation, and use of particular e-government end-user solutions (Johannessen *et al.*, 2012), an integrative, nation-wide e-government platform involves continuing stakeholder interaction and governance beyond the scope of a project. That is, we need more elaborated stakeholder models for continuing governance of complex government 3.0 platforms, such as Suomi.fi (Yli-Huumo *et al.*, 2018). Our case study contributes as a step towards this direction by identifying 15 types of stakeholder interactions to be considered and eventually managed when establishing and governing comprehensive e-government platforms.

#	Stakeholders	Interaction type	Interaction description	Governance actions and issues
1	Government of Finland **AND** Ministry of Finance	Executing, Reporting	MF executes the KaPa program and reports its progress to Government of Finland.	Execution of political strategy from government organization. Possible governance issues in understanding. Do politicians understand the project and its objectives and goals?
2	European Union **AND** Government of Finland	Policy-setting, Reporting	EU sets up policies and regulations to follow. Finland has to think/follow these in KaPa program and report them.	Possible governance issues in understanding of high level policies. Government of Finland and its organizations are uncertain whether KaPa is done according to the EU policies.
3	Government of Estonia **AND** Government of Finland	Political partnership	Government of Estonia provided x-Road free to the Government of Finland. Also an institute for x-Road co-development was established between countries.	Unstructured discussions at political level led to success in cooperation. Governance includes management of the institution and political partnership.
4	Government of Finland, Ministry of Finance **AND** Service Providers	Legislating, Resourcing	Government of Finland set up a law for public sector (*KaPa act*). Public sector organizations and municipalities are obliged by jurisdiction to take into use some of the services in Suomi.fi.	Possible governance issues in scheduling and assigning supporting resources (e.g. implementation challenges to smaller municipalities). Can municipalities and public sector organizations do the required changes in time with given resources?
5	Ministry of Finance **AND** Population Register Center (PRC)	Managing, Reporting	PRC executes the strategic plan for the development of Suomi.fi and reports its progress to MF.	The relationship between two government organizations has been operating well within existing operational structure.
6	PRC **AND** Republic of Estonian Information System Authority	Development partnership	PRC and RIA are co-developing x-Road and have created an integration between both countries own x-Road.	A well-established governance structure has been created within NIIS institute (Nordic Institute of Interoperability Solutions) to ensuring the ongoing co-development.
7, 8, 13	PRC, Service Providers, 3rd Party Software and System Integrators **AND** Finnish Government IT Centre	Managing, Consulting	In KaPa, the IT Centre is under the management of PRC and provides consultancy, especially on technical aspects of Suomi.fi development and helps with customer support.	Governance unclarities was identified. Data indicated that issues within the IT Centre possibly caused delays and problems to both other PRC and service providers.
9	PRC **AND** 3rd Party Project Development Organizations	Managing development, Reporting	PRC is responsible for the development management, but the development has been outsourced to 3rd Party Organizations.	Governance of internal development was considered as a success in media and internal reports. Use of agile with development was seen as one of the reasons.
10	PRC **AND** Service Providers	Adoption support	PRC provides support for public and private sector organizations who want to use Suomi.fi service platform.	Governance was reported to be successful by Service Providers. PRC was mentioned to be fast and supportive in dealing problems and issues.
11	3rd Party Software and System Integrators **AND** Service Providers	Consulting, Integration support	3rd Party Software and System Integrators sell services for Service Providers to integrate their systems with Suomi.fi services.	Governance aspects are important, because most public sector organizations lack own IT departments and are required to buy and make contracts with 3rd party companies.
12	Finnish Media **AND** All stakeholders	Influencing public opinion, Advertising	Finnish Media observes KaPa program and its development and reports it through mass media.	Governance of media relationship is important. Media might have both positive and negative impact on people. For example, PRC mentioned that there are some unclarities in the news, which can cause wrong view on Suomi.fi.
14	PRC **AND** Legal Entities	Usage support	PRC provides consultancy on Suomi.fi services and provides customer support to Legal Entities.	It is important to govern the educational aspects of service use, such as spreading information awareness through campaign and media.
15	eID platform	External effect	Majority of the citizens and companies that need to identify themselves to use services in Suomi.fi are required to use eID platform. eID platform is operated by banks.	eID platform usage requires governance of external contracts with banks. How to govern if contracts or technologies in eID platform change?

Table 2. Stakeholder interactions with the involved governance actions and issues (Legend: the numbered rows explain the interactions summarized in Figure 2).

While we started our stakeholder analysis in light of recent stakeholder interaction model by Greger *et al.* (2014), we needed to add elements to explain complexity of multi-layered development, governance, external influencing, and use interactions of the Suomi.fi platform. Our target case did not implement a single e-government system but involved a platform that requires careful and continuous management and governance of stakeholders and their interactions. The full service and user portfolio of the platform is difficult, if not impossible, to predict beforehand, in the assignment phase. Instead, the platform forms a connection point, where varying stakeholders, their services, and users meet as the program proceeds and governance of the resulting platform needs to be managed. The service portfolio extends and changes continuously through continuing developments. Therefore, it is important to govern the stakeholders of e-government platforms and their interactions continuously, as well.

In addition to highlighting the hitherto missing platform perspective in the e-government stakeholder models, our case contributes by illustrating the wider role of external influencers than in the previous literature. Although not influencing the platform implementation hands-on, such influencers and stakeholders as media, European Union, contributions from the Estonian government and development efforts, NGOs, and private companies play a significant role in the intersubjective process that observes and co-creates our common understanding of usefulness, value, and ultimately success of the platform in question. As the varying stakeholders have diverging needs and agendas for their particular e-government services, the very ideas about success or usefulness of large-scale platforms (or segments of services integrated in them) may vary greatly and evolve over time. Hence, stakeholder interaction models supporting governance of large e-government platforms need to be developed, which take into account the varying relations to external influencers, in addition to the multiple stakeholders participating in the tasks of assignment, design, implementation, and use. While some early stakeholder descriptions and models in smaller-scale e-government contexts (Gomes and Gomes, 2009; Fedorowicz *et al.*, 2010; Johannessen *et al.*, 2012) have hinted towards this direction, our study contributes by identifying interaction types with external influencers, the richness of interactions among platform owner, orchestrator, operator, and the multiple development and use stakeholders, and pointing out the importance of stakeholder interaction governance.

The identification of stakeholder interactions at the governance level implies six consequences for practitioners in charge of development and governance of large-scale e-government platforms:

1. Stakeholder governance in relation to (often multi-national) legislative bodies, such as EU, should align continuing platform development to continuously evolving legislative constraints and frameworks. In Suomi.fi, uncertainty in relation to developing EU strategies and subsequent legislation was expressed, which could be mitigated in the future with more explicit responsibilities for managing such stakeholder interactions with political strategists and legislators.
2. Suomi.fi had formalized stakeholder interactions on voluntary cross-border technology exchange with Estonia. This might be a good idea also on a larger scale, e.g. when launching pilot constellations of joint technological e-government infrastructures among an increasing number of EU countries.
3. Media publicity of Suomi.fi took varying stances between positive publicity highlighting economy of the project and negative publicity being skeptical on the usefulness of the overall platform altogether. Sometimes, news involved erroneous facts and terms. Simultaneously, awareness of Suomi.fi appeared relatively low even among politicians, let alone among ordinary citizens. Hence, e-government platforms might benefit from more explicitly defined practices on managing media relations and updates of related facts on the project.
4. While the source code of Suomi.fi was published in GitHub as such, management of relationships to 3rd party software and system integrators, as well as municipal service providers of varying competence, in terms of education and support might boost diffusion and wider adoption of the platform.
5. In Suomi.fi, the dominant eID solution is currently controlled by banks, which creates uncertainty for the future of electronic e-government in Finland in general – the identification service

providers represent a crucial type of stakeholder interaction to be strategically managed in cases where the government has decided to not to provide an identification service of its own.

6. In addition to governing the above-mentioned external stakeholder interactions, our case study illustrates a good number of stakeholder interactions to be managed among governmental organizations as such. As varying government actors have as well often varying goals and agendas, keeping the governance mandates and stakeholder relations up-to-date continually represents a significant management issue also in the future platform development

Altogether, sheer identification of these issues suggests that governance of relationships among the numerous stakeholders altogether appears as a non-trivial issue, requiring significant management resources. While our results only scratches the surface of the scale of this challenge, future research and development is needed to systematize stakeholder governance of Suomi.fi, and to suggest reference models for similar governance challenges of e-government platforms elsewhere. Our results can be used as a basis for targeting stakeholder management actions to the interactive relationships, which would appear challenging during the design, implementation and further governance of e-government platforms. More research is needed on whether and how such stakeholder governance would actually influence the realized outcomes of platform investments. As well, comparative studies in this regard between countries could appear useful.

6 Conclusions

We presented a case of a national e-government platform that identified 15 stakeholder interaction types during a four-year period of its initiation and implementation in Finland. The case contributed by identifying the need for managing stakeholder interactions between the platform program and external influencers in addition to the more usual stakeholder types that have been already identified in smaller-scale e-government projects. Hence, we argued that platform governance in e-government requires elaborated stakeholder interaction models and practices that reach beyond single projects or solutions. Our results provide a step towards a typology for such stakeholder governance model at the platform level. Moreover, managing the varying stakeholder types and interactions would require varying competencies from the personnel involved. While we saw already several well-governed areas in our target case, the whole picture presented here adds value and lessons learned to the target platform, Suomi.fi, and its governance itself and suggests issues to consider also for similar efforts elsewhere.

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