Aalto University
School of Science and Technology
Faculty of Information and Natural Sciences
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Designing E-government Services for Collaboration Between Citizens and the Public Sector

Master's Thesis

Helsinki, Finland, March 17, 2010

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ABSTRACT OF THE
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When aiming towards transparent government, engagement of citizens and citizen-government collaboration, there is a growing need to understand how to actually design and implement service concepts that utilize these principles. Especially there is a need to understand what new Web 2.0 technologies, social networking services and the trends of mass collaboration mean for e-government services.

The objective of this Thesis is to study how to design and analyze digital service concepts for collaboration between citizens and the public sector. The Thesis presents a model for designing and analyzing services based on an existing STOF framework. STOF is a holistic service design framework that examines a service concept from user value creation and related technology, value network and business logic perspectives. For application to collaborative e-government services, modifications to STOF are made, considering factors such as user-created content, online communities, motivations for participation and new forms of value creation.

Two practical example services, were analyzed using the modified STOF model. They were found to have several incomplete critical design issues and success factors. Suggestions for development are given based on the analysis.

Keywords:	e-government, social media, public sector, Web 2.0, business model, service design, collaboration
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Tavoiteltaessa lisääntyvää hallinnon avoimuutta, kansalaisten osallistumista, sekä kansalaisten ja hallinnon välistä vuorovaikutusta, on tarpeen ymmärtää kuinka suunnitella verkkopalvelukonsepteja, jotka toteuttavat näitä periaatteita. Erityisen tärkeää on ymmärtää, mitä Web 2.0 -teknologiat, sosiaaliset verkkopalvelut ja yhteistoiminnan trendit tarkoittavat sähköisen hallinnon kannalta.

Diplomityön tavoitteena on tutkia kuinka suunnitellaan ja analysoidaan verkkopalveluita liittyen kansalaisten ja julkishallinnon väliseen yhteistoimintaan. Työssä esitetään olemassaolevaan STOF-viitekehykseen perustuva malli, jonka avulla voidaan analysoida ja kehittää palveluita. STOF-malli on kokonaisvaltainen palvelusuunnittelun työkalu, joka tarkastelee konseptia palvelun loppukäyttäjäarvon sekä siihen liittyvän teknologian, arvoverkoston ja ansaintalogiikan näkökulmista. Työssä muokataan STOF-mallia yhteistoiminnallisten sähköisen hallinnon palveluiden suunnitteluun, huomioiden piirteitä, kuten käyttäjien luomat sisällöt, verkkoyhteisöt, osallistumismotiivit sekä uudet arvon tuotannon mekanismit.

STOF–mallia käytettiin kahden esimerkkipalvelun analysointiin. Analyysin perusteella molemmista palveluista löytyi useita puutteita yhteistoiminnallisten sovellusten menestystekijöissä. Näiden korjaamiseksi annetaan kehitysehdotuksia.

Avainsanat:	sähköinen hallinto, sosiaalinen media, julkishallinto, Web 2.0, liiketoimintamalli, STOF, yhteistoiminta
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Helsinki, Finland, March 17, 2010

Teemu Ropponen

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Abbreviations and Terms

API	Application Programming Interface. Interface of a computer system, library, or application for software developers.
AJAX	Asynchronous JavaScript and XML. A Web technique for creating richer and more interactive Web applications.
B2C	Business-to-consumer (or business-to-customer). Activities of businesses serving end consumers with products and/or services.
B2B	Business-to-business. Refers to commerce transactions between businesses.
CAPTCHA	Completely Automated Public Turing test to tell Computers and Humans Apart. A tool for ensuring that a site user is a human, not an automated program.
CDI	Critical design issue. A design variable of the STOF model that is very important to the viability and sustainability of a business model of a digital service.
COS	OtaSizle common services. Software libraries.

CSF	Critical success factor. In STOF, one of the limited number of areas in which satisfactory results will ensure that a business model creates value for the customer and for the business network
ERP	Enterprise resource planning. An integrated computer-based system used to manage internal and external resources including tangible assets, financial resources, materials, and human resources
G2C	Government-to-citizen. The communication link between a government and private individuals or residents.
G2B	Government-to-business. Online non-commercial interaction between local and central government and the commercial business sector.
ICT	Information and communication technologies. An umbrella term that includes any communication device or application.
IPR	Intellectual property rights. Exclusive rights over creations of the mind, both artistic and commercial, typically referring to, e.g., copyrights and patents.
IT	Information technology. A broad subject concerned with aspects of managing, editing and processing information.
IS	Information systems. Organizations of data-processing persons, records, and activities.
JavaScript	An object-oriented scripting language, typically used on the client-side, e.g. in web browsers, to allow development of rich interfaces and dynamic services.
NGO	Non-governmental organization. A legally constituted, non-governmental organization created by natural or legal persons with no participation or representation of any government. Also called civil society organizations.

PSI	Public sector information. Information, including information products and services, generated, created, collected, processed, preserved, maintained, disseminated, or funded by or for the government or public institutions.
REST	Representational State Transfer. A style of software architecture for distributed hypermedia systems such as the World Wide Web, commonly associated with Web 2.0 services.
ROI	Return on investment. The ratio of money gained or lost (whether realized or unrealized) on an investment relative to the amount of money invested.
RSS	Really Simple Syndication A family of web feed formats used to publish frequently updated works such as blog entries, news headlines, audio, and video in a standardized format.
SIG	Special interest group. A community with a interest in advancing a specific area of knowledge, learning or technology.
UGC	User-generated content. Various kinds of media content, publicly available, that are produced by end-users. Also UCC, User-created content or CGM (consumer-generated media) are sometimes used synonymously.
W3C	World Wide Web Consortium. An international consortium that develops standards for the World Wide Web.
XHTML	Extensible Hypertext Markup Language. A family of markup languages that mirror or extend versions of the widely used Hypertext Markup Language (HTML), the language in which web pages are written

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Chapter 1

Introduction

Since the Internet gained popularity in the 90's, high expectations have been laid upon it related to its potential as a platform for better democracy – in Finland and around the world. E-government – the ways for engaging with citizens and governments by means of electronic channels, particularly Internet – has been seen both as a huge opportunity for creating a vibrant democracy as well as yet another inflated hype bubble.

From a political and societal point of view, there are some alarming trends in our society. It has been claimed that western democracy has a *legitimacy crisis* due to declining participation in our representative democracy (Slevin 2000). Citizens are voting less in elections and at the same and taking less part in political discourse through traditional political parties (Borg 2006). People are also participating less in traditional associations and non-governmental organizations that have been considered a measure of the *social capital* (Putnam 2000). Governmental organizations are thus keen on understanding how they can improve citizen participation and on the other hand, simply serve the citizens better – to legitimize their existence and authority to the constituents (Slevin 2000, Sæbø et al. 2008).

In Finland, the e-government strategy raises Internet-based services and tools as an important vehicle for increasing democracy, validating the quality of decisions and for promoting acceptability of decisions, regulations and political processes. (Executive group and auxiliary working group for development plans and action plan for eServices and eAdministration between 2009 – 2012 2009). However, while in the past Finland has taken pride in being among top e-government societies, Finland has in recent years dropped considerably in various information society, e-democracy and e-government related rankings (Finnish Ministry of Finance 2009, United Nations 2008).

One of the recent interesting Internet phenomena has been the emergence of social media. By end of 2008, social media (Facebook, MySpace and others) has surpassed email in popularity – an indication that the way people communicate appears to be fundamentally changing (Nielsen Company 2009). In fact, social media has become a huge social phenomenon that is significant in our society – and it cannot be labeled only as an Internet trend, but rather as a social trend as well, that is both a cause and effect of some other interesting trends going on in the society – such as the move from an industrial information age towards a networked information age (Benkler 2006).

These are changes that the governments around the world cannot ignore, but must rather take into consideration when thinking about their strategies for engaging with their constituents. Potentially, social media is a key technology enabler for participation in different ways. Social media looks to be a promising way to encourage people to participate – but also on the citizens' grounds – it is an effective tool for self-organized and bottom-up behavior.

According to research, as much as 85% of e-government initiatives fail (Heeks 2001). At the same time, there has been a lack of tools for evaluating-government projects and initiatives (Esteves & Joseph 2008). This Thesis examines how to design and evaluate modern e-government services that fulfill user needs and are sustainable in the sense of creating benefits at reasonable costs, i.e., how to create digital services that create value to citizens and government agencies alike.

1.1 Projects at Helsinki University of Technology

The work of this Thesis relates to two particular research projects at Helsinki University of Technology (TKK). While concentrating on several projects is a challenging task, it gives an opportunity to look at cases that have a lot in common, but naturally also differ in point of view and goals.

SOMUS - "Social media for citizens and public sector collaboration" - is a research project funded by the Academy of Finland during 1.1.2009-31.12.2010. Somus aims at creating new understanding of citizenship, publicity and participation in decision-making in the era of social media. To demonstrate and evaluate new media concepts that are enabled through open interfaces between public sector, mass media and citizen groups. (Kansalaismedia Somus 2010)

HILA Open Oy is a new business venture, a spinoff from TKK that aims at providing the public sector new kinds of tools for two-way dialogue, by means of open and transparent implementation of feedback channels and mechanisms. HILA implementation is a novel distributed way of bringing social media into daily life of public sector organizations. Currently HILA is working with both local and national level government agencies. (HILA Open Oy 2010)

1.2 Research Problem and Goals

The question remains: 'How could our system of democracy benefit from the Internet and the rise of the social media phenomenon?' Moreover, on a very practical level: 'How should digital services be designed so that they most benefit the citizens as well as the public sector?'

In the public sector, revenues, business logic and business models are often quite difficult to analyze. "Business" and "revenue" seem alien terminology in this context.

For example, citizens seldom pay for the governmental (digital or otherwise) services they use. Services are typically not even created for the purpose of "creating sustainable, profitable business". Instead the benefits may comes from elsewhere - savings of, e.g., tax money or increase in value factors such as security, participation, openness or social welfare, which are difficult or impossible to measure.

The STOF model is a way of describing, innovating and developing digital service concepts and their business models (Bouwman et al. 2008a). This Thesis is based on the STOF model and examines e-government services using this model and its derivative, the STOF method.

The key research problem of the Thesis can be summarized as**:**

How to design and analyze digital services that promote the collaboration between citizens and the public sector agencies and create value to the different parties?

For the scope of the Thesis, the following were identified as concrete **research goals**:

1. **Define concrete guidelines** for developing social media –based public sector services.

2. Give input into **developing the STOF model and STOF method,** from the point of view of how to apply STOF in the context of e-government and social media; suggestions for modifications can be given if necessary

3. Give input to the services analyzed in the Thesis. Input is given in the form of **concrete suggestions in terms of alternative ideas for offering, service definition or business planning**, based on the STOF method

The Thesis work can be considered successful if provides good insight to the reader for the development of e-government services that utilize elements of social media technologies and related phenomena for the engaging citizens and civil servants in a lively discussion and collaboration.

1.3 Scope Definition

In the context of a Master's Thesis, scope must be limited. In this work, only two cases are studied, which limits the extent to which any generalizations can be made. The studied services are limited to services related to e-democracy that encourage participation amongst citizens and civil servants. These examples do not even attempt to cover the whole spectrum of e-government services.

The research cases are examined by using one (STOF) method (and its possible modifications) only, not for example as comparisons of results from using other methods. Some other methods or frameworks for the similar purposes do exist and are mentioned in the Thesis, although no thorough analysis or comparison of the different approaches is made.

One studied case is a local government example, while the other case is a more general service, although examined from the point of view or central government.

1.4 Research Methods

The core of the Thesis is based on (qualitative) STOF analysis of two particular cases.

First, desk research is used to study the theory related to the domain of these cases: e-government, social media and business models of Internet services. Some similar cases in the industry are studied. Based on this theory, modifications to the STOF model are suggested. Then, two different service concepts are used as in-detail case studies. These cases are analyzed using a common framework and methodology, based on the STOF method and the modified STOF model.

The STOF method in itself uses several methods, which can be selected depending on the application domain. In these cases, the analyses are based on desk research, customer interviews and workshops in which multiple parties (service provider, customers, and end-user organizations) explicate their views on the various issues related to the services.

1.5 Structure of the Thesis

The rest of the Thesis is organized as follows:

Chapter 2 briefly explains the basic concepts of democracy and citizen participation. More importantly, the definitions of e-government concepts and description of the Finnish implementation are given. In addition, the situation compared to other countries and strategic goals for e-democracy are described. An indication of the direction of development in e-government is given.

Chapter 3 presents social media concepts and recent developments in this area. Not only technological advancements are studied, but also recent societal implications and trends enabled by this development are defined. In addition, social media is introduced in an e-government context. Some practical considerations in the design of public sector services are introduced.

Chapter 4 presents the concept of business models in digital services and tools and methods for analyzing them. E-government business models are introduced. Service design and analysis methodologies based on the STOF model and STOF method, which are fundamental to the Thesis, are introduced in detail. In addition to STOF, some other business modeling frameworks and concepts are introduced briefly. Based on literature and existing digital service design tools, some interpretations and modifications to the STOF model are made, for the purpose of applying them to services based on social media and in the e-government domain.

In Chapter 5, actual services designed during the TKK research projects are analyzed by means of the STOF model, its modifications and the STOF method. Key findings of these individual cases are analyzed in detail and reported.

In Chapter 6, key results of the analyses are summarized. Based on the practical applications of the method, some thoughts are given on how to improve the STOF model and STOF method itself and how to apply it in similar cases. Applicability of the modified STOF method, its generalization and the validity of the results are also considered. Further research topics are suggested.

Chapter 2

Introduction to Electronic Government

This chapter includes fundamental terminology related to democracy and its forms and important related themes like participation. Electronic government and e-democracy are introduced, especially in terms of Finnish and European political interpretations of these concepts. In addition, key highlights of information society and e-government strategies, goals and visions in Finland and EU are introduced.

2.1 Some Key Principles of Democracy

It is not easy to clearly define what exactly is meant by democracy. Originally democracy referred to a form of government, derived from the antique Greece, in which citizens (originally meaning free males) themselves participate in the decision-making and governing of the people. Nowadays we refer to democracy to mean, e.g., the fulfillment of the will of citizens (or at least majority will), the methodology for choosing decision-making representatives, a form of society, or as a more general value. (Borg 2006)

Fundamental elements of democracy can be thought to include basic citizen rights, a democratic civic society (*kansalaisyhteiskunta*), fair elections as well as responsible and accountable government. Ideally, a considerable portion of citizens take part in the use of political power, either directly or at least by monitoring the actions of elected political representatives. (Borg 2006)

There are a great number of democratic forms and theories and these forms and theories can be further broken down. Within the classifications, one key distinction is between *liberal* (indirect, representative) and *participatory* (incl. deliberative) democracies. Other schools include *strong democracy* (a form of participatory democracy), network democracy, customer democracy, media democracy and consumer democracy. This new terminology is some indication of changes in forms of participation and political power – action and political power has been transferred to new arenas. (Barber 1984)

2.1.1 Participatory Democracy

Democracy and its legitimacy is strongly based on the participation of the citizens, i.e. constituents, being governed. Traditionally the concept of citizen participation is most present in common elections, in which citizens vote on the policy alternatives presented by political parties and their candidates. (Borg 2006) On the other hand, participation should not be limited to just normative participation (i.e., voting) but should include all kinds of social interaction with public decision-making (Nousiainen 1998).

Participatory democracy (or *strong democracy*, as Benjamin Barber, one of the theorists of the participatory democracy calls it) emphasizes continuous participation of citizens, not just at the time of elections, when voting for representatives. It is based on strong democratic discussion and debate and equal discussions between parties, which aims at not only pushing forward personal goals, but also listening to the arguments of others. (Barber 1984)

Many democracy theorists have been concerned about the declining trends in citizen participation and poor possibilities for participation in so-called old (and strong) democracies within the last decades (Borg 2006). In a well-functioning democracy it must be "worth the effort" to participate in the political process (Paloheimo 2005). For example one can ponder about the trend in decline of voting against this principle (Mäenniemi 2009).

However, there are also more optimistic studies claiming that the decline of traditional ways of participation does not necessarily imply less interest social networking or societal participation. Also, since the political goals on a personal level may more often be outside the scope of a nation's political agenda – multinational or global (like the climate change), the way people participate is changing. (Finnish Ministry of Finance 2009)

2.1.2 Participation Methods

In addition to voting in elections, the formal methods of participation in various political processes include consultation, participation and inclusion

Consultation (in Finnish administrative terminology "*kuuleminen*") is a commonly used method or principle in inclusive governance practices to involve non-government organizations and citizens. Consultation is executed as directed by law, e.g., in evaluation of environmental effects or in projects, in which consultation is considered a good way to understand the citizen opinion and for getting new points of view.

Participation **(***osallistuminen***)** refers to collective action and interactivity between people. Its purpose is to raise important issues into public debate, support or object the current state of affairs or start new initiatives.

Inclusion **(***osallistaminen***)** typically means that it is the decision-makers, authorities, and administration who actively try to get citizens involved in the participation. This means that the administration initiates the action and also defines the "scope of participation". (Finnish Ministry of Justice 2009a)

2.1.3 Municipal Democracy

Just as on a national level, there has been an expression of concern regarding the low, or at least declining interest in the local municipality elections. Voting turnout has constantly been lower in municipal elections than in national elections. Low participation rate and a certain disinterest can be considered surprising in the sense that the municipality is typically the level of decision-making that is actually closest to the daily lives of citizens. At a municipal level, decisions concerning, e.g., infrastructure, welfare services and municipal planning (like construction) are made. (Borg 2006)

In 2008, a study found that about half of the citizens in municipalities were at least "moderately interested" in the governance and decision-making in their home municipality (Borg 2006). The perception of citizens regarding their own possibilities to influence is a key indicator of municipal democracy. For example, in the metropolitan Helsinki, majority of citizens believe that in fact they have little or no say on how the city council decides (Ahokas 2009). Factors like this indicate that actions need to be taken to restore trust in the municipal democracy.

Although the decision-making in municipalities is also representative-based, a lot of activities and support have been directed in the past decades towards participatory measures, with the goal that representative and participatory democracies complement each other. The ways to promote democracy in municipalities are essentially the same as mentioned earlier. (Borg 2006)

2.2 E-government and E-democracy Concept of Finland

E-government can be defined as the transformation of public sector internal and external relationships through internet-enabled operations, information technology and communications, to optimize government service delivery, constituency participation and governance (Baum et al. 2000). Esteves and Joseph point out that e-government changes the nature of relationships from hierarchical command-and-control to an interactive collaboration, provides a platform for multi-channel interaction and multi-service delivery options, and is about having centralized yet distributed operations to maximize efficiencies, productivity, and service delivery (Esteves & Joseph 2008).

The SADe report (Finnish Ministry of Finance 2009) describes the current e-government concept in Finland. In the Finnish e-government concept, as depicted in Figure 1, there are three distinct, but overlapping areas, e-services, e-administration and e-democracy [1].

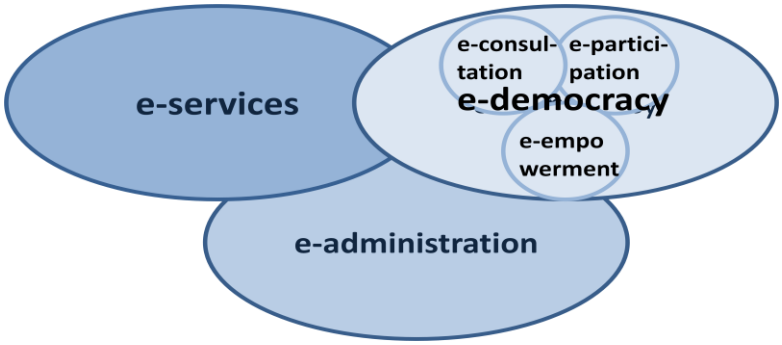

Figure 1: Finnish three-level e-government concept and a further three-level breakdown of e-democracy (Finnish Ministry of Finance 2009)

[1] Many of the terms related to electonic government lack a universal spelling format, literature includes spellings ‘e-government’, ‘e-Government’ and ‘eGovernment’ . Although the Finnish e-government plans spell the terms eDemocracy, eConsultation, etc., the spelling e-democracy, e-government, etc. is used throughout this Thesis.

E-administration refers to the internal processes, data and information storages, and information systems of the public administration. ***E-services*** refer to electronic services and patronization for citizens and businesses.

E-democracy means the use of ICT by governments in general used by elected officials, media, political parties and interest groups, civil society organizations, international governmental organizations, or citizens/voters within any of the political processes of states/regions, nations, and local and global communities (Clift 2003). In the Finnish concept, e-democracy is further broken down into the domains of *e-consultation*, *e-participation* and *e-empowerment*. (Finnish Ministry of Finance 2009)

The goals of e-democracy (and e-consultation) are *increasing democracy*, *improving quality of decisions* and *promoting acceptability of decisions and regulations*. The concrete goals are to create and accomplish the methods and channels of internet participation, which allow citizens to express their opinions about issues in the drafting process, discuss deliberatively about the issues, express their own points of view in societal discussion, preparation and decision-making and gain experiences of influencing and in the end, "making a difference". (Finnish Ministry of Finance 2009)

2.2.1 E-consultation

Consultation is a two-way relationship between citizens and government, providing a feedback mechanism from government to citizens. Governments define the issues for consultation, set the questions and manage the process, while citizens are invited to contribute their views and opinions. (OECD 2003)

E-consultation does not, in principle, differ from traditional or face-to-face consultation. The key difference is the use of ICT as facilitating technology. By means of e-consultation, the administration aims to improve the quality and efficiency of drafting new policies. Tools used in e-consultation in Finland include electronic consultation forms (*lausuntolomake*), online polls, following of Internet discussion forums (like otakantaa.fi, an online governmental discussion forum with capability to comment on certain current issues), and other information sources. (Finnish Ministry of Finance 2009)

2.2.2 E-participation

Macintosh defines e-participation as "the use of information and communication technologies to broaden and deepen political participation by enabling citizens to connect with one another and with their elected representatives" (Macintosh 2006). Typically e-participation is associated with some form of political deliberation or decision-making and can take place within the formal political processes (e.g. voting), or outside it (e.g. political activism) (Sæbø et al. 2008).

With regard to e-participation, the administration aims at developing consultation and new participatory methods. As with e-consultation, the point of view is to increase inclusion and thus promote acceptance of decisions. In addition, e-participation tools and methods aim at increasing deliberation in the policy-making processes. In addition to previously mentioned (e-consultation) tools, e-participation tools can also include, e.g., wiki for drafting of documents, discussion forums, chats and blogs. (Finnish Ministry of Finance 2009)

2.2.3 E-empowerment

Empowerment (*voimistaminen*, voimaantuminen, voimistuminen, valtaistaminen other terms also used in Finnish) is a concept familiar in the fields of pedagogy, psychology, sociology and economics. It refers to increasing the strength of individuals and communities, e.g., by developing their confidence in their own skills. Mäkinen proposes the *digital empowerment process* as a means to strengthen the awareness and capability of individuals and communities to actively and critically participate in the information society, as independent and cooperative actors. (Mäkinen 2009)

Digital (or e-) empowerment is used to describe the empowering process, which utilizes digital tools such as new information technology to promote empowerment. E-empowerment also means the possibility to not just take part in the current policy-making processes, but also the capability to be involved in shaping the societal agenda. The point of view is in increasing democracy at all levels. In addition to the previously mentioned (e-consulting and e-participation) tools, e-empowerment tools include petitions (*vetoomus*), initiatives (*aloite*), e-voting and blogs. (Finnish Ministry of Finance 2009)

2.3 Status and Development of E-government in Finland and in the EU

There are several theoretical approaches on rating the progress of a government in its e-government developments. Kayne and Lee defined a four-stage e-government maturity models (eGMMs), with stages *catalogue*, *transaction*, *vertical integration* and finally *horizontal integration*. These stages advance from low complexity and sparse integration, to a one-stop shop with high complexity and and complete integration (Layne 2001).

A model used by Catalunya government in Spain was composed of five stages: publication of information, interaction, transaction, integration/collaboration, and transformation (Olivares 2005). The eGMM presented by Riley shows e-government moving through three different stages, moving from net presence (e-government) through to service provision and representative democracy (e-governance) and on to a final stage of comprehensive participation, (e-democracy) (Riley 2001). However, in addition to rating e-government as a whole, individual services can and should be assessed as well.

In the EU, the e-government policy environment has evolved from an approach of "bringing public services online" to a concept of effective and user-centric service delivery in an inclusive and competitive European society. The EU i2010 eGovernment Action Plan includes a rating system, as depicted in Figure 2, in which digital services can be ranked on their sophistication as a measure in five levels. (European Commission 2006)

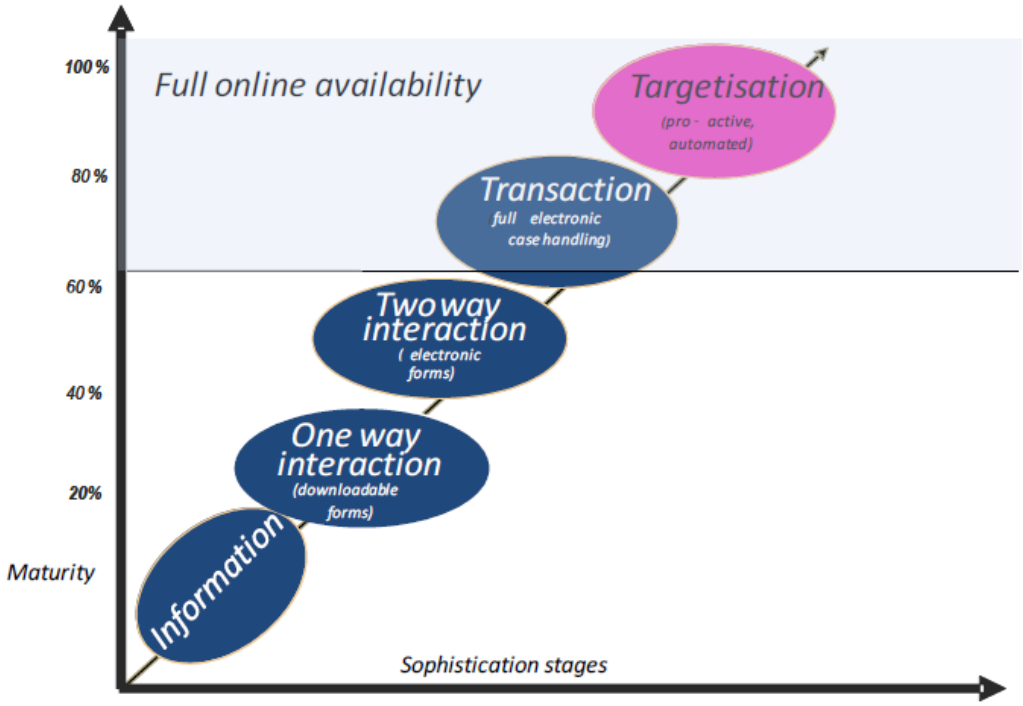

Figure 2: Sophistication of online services (European Commission 2006)

The i2010 eGovernment Action Plan outlines efforts to help nations advance in e-government toward the sophisticated level "Personalization". Key priorities in this plan include (European Commission 2006):

1. Advancing inclusion through e-government so that all citizens access the services

2. Efficiency and effectiveness, which contribute to high user satisfaction, transparency and accountability, and a lighter administrative burden.

3. Implementing high-impact key services for citizens and businesses: by 2010, 100% electronic availability of public procurement with 50% actual usage, and agreements on cooperation on further high-impact online citizen services

4. Enabler technologies, e.g., allowing citizens and businesses benefit from convenient, secure and interoperable authenticated public service access across Europe

5. Strengthening participation and democratic decision-making - creating effective tools for public debate and participation in democratic decision-making

2.3.1 Status of Finnish E-government

Once considered one of the leaders in e-government, Finland is far from impressive performance in its e-government activities. Finland has now dropped in various EU and international e-government and e-democracy rankings. According to a UN survey in January 2008, Finland was ranked as low as 43rd in a survey of participatory e-democracy tools offered on the Internet (United Nations 2008), and other rankings have also shown a decline (Finnish Ministry of Finance 2009).

There are still a limited number of participatory channels and they are too distributed. Consultation and interaction on the Internet has not yet been transformed into a natural way of working within the government agencies. Among the barriers found are resource issues (limited resource allocation), cultural issues (slow change), competence issues (lack of skills, taking offline practices online 'as is') and management issues (random activities, inconsistencies, too administration-centric approach. Also, the connection between participation and decision-making has not been apparent to end users, to be worth the effort to participate. Too much of the development has been done from a systems and technology point of view – the administration has not made a clear difference between participation/inclusion and "customer feedback". (Finnish Ministry of Finance 2009)

The attitudes of administration towards digital services and citizen involvement have not been very positive. Although there is, maybe surprisingly, a lot of support for citizen interaction within older and more experienced civil servants, there is resistance from younger civil servants as well as the management of government agencies. (Matikainen 2008)

As a result, actions are being taken to repair the situation. Among the actions defined is creating a new participatory infrastructure. In developing this infrastructure, concrete things that need to be done include (Finnish Ministry of Finance 2009):

- citizen and end-user perspective: making electronic participation mechanisms easily available and discoverable, making them easy to use for citizens and agencies, noting special needs

- technological: continuous development, exploiting possibilities of interactivity, social media and Web 2.0, integrating participatory tools to the integrated infrastructure of the government, also integrating to existing services and audiences, not just creating new and isolated ones.

- organizational issues (like job role definition updates, training about citizen consultation and interaction, setting up networks within the government, continuous evaluation, understanding of new possibilities), partnerships with civic society players and organizations

The guidance of government agencies will be developed so that they are required more clearly to ensure that citizens have opportunities to influence drafting, preparation and decision-making – new kinds of consultation and interaction methods will be taken into consideration when developing these rules, regulations and recommendations. (Finnish Ministry of Finance 2009)

Already, in a recent EU study in November 2009, Finland had risen in rankings. The report (European Commission 2009) states that

> *"Finland has been and still is one of the top performing nations in most Information society and eGovernment benchmarks. It has considerably improved online availability and leads in eGovernment usage and user-friendliness. Finland has a truly citizen centric vision of (e)Government and an inclusive approach to eGovernment strategy formation, involving experts from all layers of government, non-government actors and experts. It has deliberately sought to concentrate its eGovernment efforts (IT deployment and administrative transformation) under one ministry with support of a powerful CIO function."*

The general goal in e-administration and e-government is that in 2015, Finland should rank among the top 5 counties in the most well-known rankings (Finnish Ministry of Finance 2009).

Chapter 3

Social Media, Mass Collaboration and E-government

In recent years, many previously envisioned trends in participation are becoming possible and emerging, thanks to a new wave of internet technologies and practices, i.e., *social media*. This chapter begins by defining social media and its related terminology and technologies at a high level. Then some principles of participatory economics are explained. In the light of the presented topics, an introduction to social media in e-government is given, along with a few relevant e-government cases are briefly explained briefly.

3.1 Social Media and Social Networking Services

3.1.1 Social Media

According to VTT, the concept of social media is based on three key elements: *content*, *user communities* and *Web 2.0 technologies*, as illustrated in. In social media applications content is wholly or partially generated by end-users or at least the content and interactions created by the users have a significant role in adding value to the application or service. Interaction between people may be, for example, sharing, commenting and exchanging contents in virtual communities. (Ahlqvist et al. 2008)

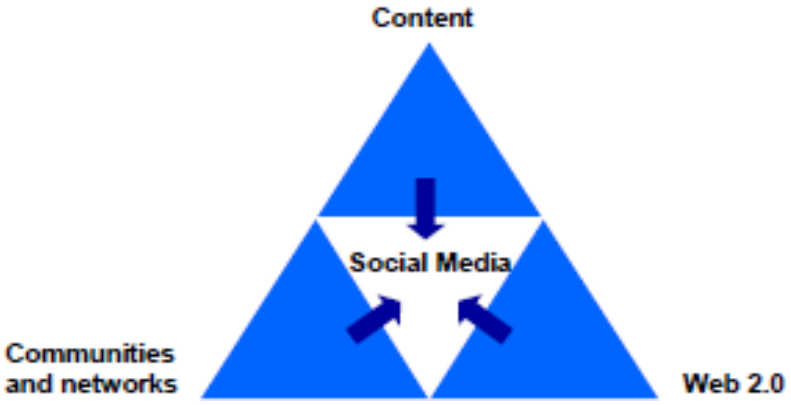

Figure 3: Key elements of social media (Ahlqvist et al. 2008)

Furthermore, social media services are characterized by (Kangas et al. 2007):

- participation
- openness
- discussion
- communities
- networking

Erkkola finds a larger context for social media, defining it as a technology-tied and structural process, in which individuals and groups construct common meanings through *peer-to-peer production* and *produsage*. At the same time, social media is a post-industrial phenomenon, which – due to its effects on the transformations of production and delivery mechanisms, has effects on the culture, economy and society as a whole. (Erkkola 2008)

Ellison defines *social network sites* (SNSs) as web-based services based on user profiles. SNSs allow individuals to construct a *public or semi-public profile* within the service, create *lists of other users* with whom they are connected to, and view and traverse their list of *connections*. Most importantly SNSs make the social networks of users explicitly visible. Examples of services mentioned, like Facebook and MySpace, have in other instances been labeled social media services, meaning that in practice it is difficult to distinguish between social media and social network (or networking) sites. (Ellison 2007)

Lietsala and Sirkkunen have found that most popular social services have the following characteristics (Lietsala & Sirkkunen 2008):

- There is space to share content.
- Participants share, create, evaluate all or most of the content.
- They are based on social interaction.
- All content has a URL to link to external networks or services.
- Actively participating members have a profile page.

In addition, features that often occur include (Lietsala & Sirkkunen 2008):

- There is a feeling of a community.
- People contribute for free.
- There is a tagging system that allows *folksonomy*.
- Content is distributed with feeds in and out of the site.
- Platforms and tools are in the development phase and changed on the run.

3.1.2 Web 2.0 Technologies

Web 2.0 is a term originally referring to technologies and techniques commonly used in new kinds of web-based social networks and social media services. Typically Web 2.0 is thought to include facilitation of information *sharing*, *interoperability* through open APIs, *user-centric* design and joint *collaboration* between users. (O'Reilly 2005)

Examples of Web 2.0 applications include (O'Reilly 2005):

- applications for content creation and storage, hosted services, social networking sites, video-sharing sites, wikis, blogs, mashups and microblogs
- applications for content finding, folksonomies (tagging) and social bookmarking, RSS and other syndication methods, content sharing
- interoperability between applications and their data - APIs, mashups, REST APIs

Through social media, and using Web 2.0 technologies individuals or collaborations of individuals (“wisdom of crowds”) create, organize, edit, comment, combine (or *mash up*) and share content. (O'Reilly 2005)

3.2 New Forms of Mass Collaboration

3.2.1 Peer Production

Benkler argues that we are heading towards (or are already living in) a *networked information economy* (as opposed to what he calls *industrial information economy)*. The two fundamental changes related to this economy are the change to an economy based on information, cultural production, and manipulation of symbols (e.g., branding) and the low cost of interconnected computing power, i.e., Internet. In this economy, decentralized and individual action plays a greater role than it did (or could have played) in an industrial information economy. This economy will also include radically distributed non-market mechanisms, which (if permitted) will be at the core of most advanced economies. (Benkler 2006)

Similarly Tapscott and Williams suggest that a "new mode of peer production will displace traditional corporation hierarchies as the key engine of wealth creation in the economy" (Tapscott & Williams 2006). Perhaps the best know example of the enormous power of peer production is the production of Wikipedia, which is a free online encyclopedia that is constantly co-written and co-edited by users - with monthly contributions by about 100 000 people (Wikimedia Foundation 2009). In a few years, Wikipedia has proven itself to be wider and at about the same quality as established encyclopedias, such as Encyclopedia Britannica (Giles 2005). In addition, it is self-healing and self-improving by nature (Benkler 2006). This is an example that an involved community as a whole, if sufficiently large and varied, can contribute more than a closed team of producers, however qualified this team may be (Bruns 2007). At the same time, it highlights the potential of social media for the purpose of co-creating a useful utility for its users.

According to Benkler, especially two things attribute to successful peer production. *Modularity* refers to how a project can be broken down into components, or modules that can be independently chosen and autonomously produced by contributors. Modularity allows for autonomy and flexibility in participation. *Granularity* refers to the size of these modules, in terms of effort and time needed in production. In Wikipedia, for example, articles are fairly short by nature, and thus it is easy to contribute comments or additions to these articles, compared to some other peer production efforts. (Benkler 2006)

3.2.2 Produsage

The peer production and consumption processes in social media services tend to intertwine – the roles are not clear and obvious as in many traditional content creation and consumption processes. Roles of users are fluid – participants are able to switch frequently and repeatedly between acting as producer (content creator) and as user (consumer) of the content developed by the community, collaboratively. This new type of collaborative process can be defined as *produsage*. (Bruns 2007)

Participants have *fluid roles* and participate according to their personal skills, interests, and knowledge, and may form loose sub-groups to focus on specific issues. Content artifacts in produsage projects are continually *under development*. Contributors permit (non-commercial) community use and development of their intellectual property, and are in turn rewarded by the status capital they gain through this process (*Common Property, Individual Merit*). (Bruns 2007)

3.2.3 Crowdsourcing

Crowdsourcing (Howe 2006) is a model for distributed problem-solving and production in which tasks of an organization typically performed by traditional means of production, i.e., an employee, team of workers or by a contractor is instead performed by a group of people or community ("crowd") outside the organization. This crowd is often undefined and is compensated little or not even at all, thus differentiating from sourcing or contracting. Unlike open source, crowdsourcing activities are typically initiated by a client and the work may be undertaken on an individual, as well as a group, basis. Other differences between open source and crowdsourced production are related to the motivations of individuals to participate. (Howe 2006, Brabham 2009)

The term has become popular in social media or Web 2.0 services, but the term itself can also be used to describe other forms of mass collaboration. It is based on notions that there is "wisdom of crowds" in the masses, i.e., external crowds can provide a wider range of talent or problem-solving capability than the organization. For example, crowdsourcing in product development allows an improved customer understanding as well as a sense of kinship with the crowdsourced community. The community feels a sense of ownership through contribution and collaboration. (Brabham 2009)

3.2.4 Economics of Participation

Participatory economics can refer to a market regarding those forms of innovation, production, refinement, distribution, exchange, competition and consumption of material or immaterial services and goods which require collective or mass action on the Internet. Hintikka divides participatory economics into four categories: social media, mass production and distribution, crowdsourcing and synthetic goods, professions and markets. Participatory economics is about open sharing and collective benefit, exchange of value, but with non-monetary mechanisms. Organizations may, for example, share something on the Internet to a crowd of users – at a risk, not knowing whether or not anything will be developed out of it. (Hintikka 2008)

Lietsala and Sirkkunen formulate participatory economy in a different way. Participatory economy is based on *use-value* for a community of users – use-value may be, e.g., fun or meaning. Participation creates some kind of *social capital* - know-how, fame, or trust within the community, or self-satisfaction. Processes *empower* people to do things together with other outside formal organizations. Activity that brings some use-value to the participant creates different kind of value to somebody else, too, such as other users, other stakeholders or the site owner. (Lietsala & Sirkkunen 2008)

Hintikka states that participatory economics has implications and applications in, e.g., commercial activities, learning, networked collaboration – and also in civic activism and governance (Hintikka 2008).

3.2.5 Participation in Online Communities

In order for social media (or any digital) services to succeed, users must have motivations to use the service. Lietsala and Sirkkunen have found that common reasons or motivation factors to participating in social media include (Lietsala & Sirkkunen 2008):

- self-expression - “you are what you share” (Leadbeater 2009)
- real community
- faces and profiles
- content through rankings
- noticing and rewarding best content

In addition, it is worth noting that monetary incentives may be negative (Lietsala & Sirkkunen 2008). Shawhney and Prandelli argue that prerequisites for online communities that create new products are common interest, sense of belonging, a shared language and ground rules for participation (Sawhney & Prandelli 2001).

Sense of community is associated with the feeling of belonging and being attached to an online community. In a study by Blanchard and Markus, the experienced sense of community in an online community was actively maintained through the social processes of *exchanging support*, *creating identities* and *making identifications*, and the *production of trust*. These processes are in fact similar to those in non-virtual communities, but related to the challenges of electronic communication. (Blanchard & Markus 2004)

Heinonen divides the development of a sense of community into five different stages (Heinonen 2008): 1. Identification; getting acquainted and becoming friends; Shared interests; Affection; and Commitment. Heinonen also notes that there are four distinct groups in the communities of the virtual space, random visitors; new members; members, who participate regularly; and the core group. All these groups and stages should be taken into consideration when designing services with the goal of building online communities out of groups of users. (Heinonen 2008)

One approach to designing e-business services with online communities was defined by Hagel and Armstrong. They defined the key steps to building a successful community as: transaction offers that attract users to commit transactions, interesting content to attract more users to the service, user loyalty created through interactions between users and user profiles that are used for targeted marketing and offers. (Hagel & Armstrong 1997) According to Hintikka, this same approach is valid for designing and analyzing Web 2.0 services, including e-government services (Hintikka 2007).

It is also important to understand the dynamics of participation. Regarding online communities, participation can be estimated in terms of the 90-9-1 rule, originally presented by Jakob Nielsen. The rule means that in an online community, approximately 1% of users are very active participants and for example create content and are present seemingly all the time. 9% of users contribute occasionally. 90% of users are lurkers, who may read or observe the online community or service, but do not participate. Nielsen also calls this phenomenon participation inequality and proposes that although there is no definite way to overcome this effect, participation barriers can be encouraged by means of rewarding users, promoting editing over creating and by making participation a side effect. (Nielsen 2006)

Kailanto presents sixteen quality criteria for assessing social media services, in five categories: *privacy and security* (including identity and privacy levels), *trustworthiness and reliability* (of users and user-created content), *support for navigation* (user-created classification with tags, feeds), *accessibility* (content creation) and finally motivating and rewarding users (personalization, design for different user groups (Kailanto 2008).

It is important to note that as social media services do not have content or community in the beginning, the value proposition to the user community is started from scratch, perhaps in a way similar to the way presented by open-source pioneer Eric Raymond (Raymond 2000):

> *"When you start community-building, what you need to be able to present is a plausible promise. Your program doesn't have to work particularly well. It can be crude, buggy, incomplete, and poorly documented. What it must not fail to do is (a) run, and (b) convince potential co-developers that it can be evolved into something really neat in the foreseeable future."*

3.3 Social Media in E-government

3.3.1 Web 2.0 and Social Media in E-government

The term ***Government 2.0*** is sometimes used to refer to modernisation of the way governments engage and collaborate with the citizens. Government 2.0 involves policy shifts in culture and empowerment of citizens, harnessing the opportunities of new technologies.

The principles of Government 2.0, as depicted in Figure 4 were summarized as (Government 2.0 Taskforce 2009):

- leadership, policy and governance to achieve necessary shifts in public sector culture and practice
- the application of Web 2.0 collaborative tools and practices to the business of government
- open access to public sector information (PSI)

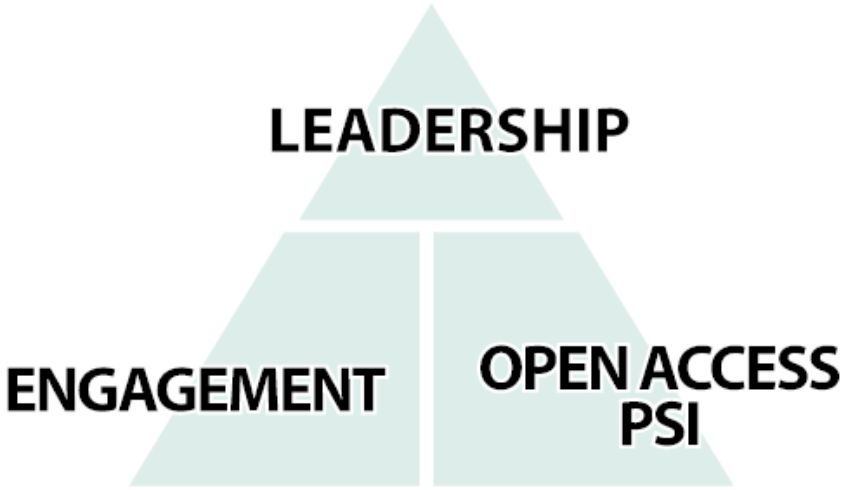

Figure 4: The three pillars of Government 2.0 (Government 2.0 Taskforce 2009)

Osimo studied a number of cases of Web 2.0 and government. He found that Web 2.0 and social media are also relevant in the government context. While the most visible impact is in the domain of political participation, impact can be seen in both the front (service provision, political participation and transparency, law enforcement) and back office: (regulation, cross-agency collaboration, and knowledge management). Web 2.0 applications are already being used in government in soft issues, such as public relations and public service announcements, but also for core internal tasks such as intelligence services; reviewing patents; and enabling public participation in decision making. However, wide and significant impact is not yet visible in most cases. (Osimo 2008)

In the transition towards Government 2.0, there are various roles the government can play. The government can offer or serve as a platform that (Finnish Ministry of Finance 2009):

1. enabler of content produced by citizens
2. information distributor – the government offers information and data flows and archives, which can be used by the people, to develop applications that may recycle, reuse and *mash up* these forms of data into new applications
3. facilitator – the government/administration empowers, offers a better possibility for people to influence by means of modern technologies
4. presence and service – administration is present in virtual communities where the people already are participating

Osimo warns of common mistakes like adopting only the technology, without the values, not deploying the appropriate governance mechanisms, and development of proprietary Web 2.0 applications, while most collaboration and conversation actually happens outside government websites and/or across applications. Also, user participation cannot be taken for granted but needs to be proactively cultivated. (Osimo 2008)

The immediateness and personal, direct presence in social media presents some practical problems to civil servant users. In addition to the issues of open data, issues mentioned by public servants include, e.g., unclear work roles, identities and privacy issues (e.g., Wirkamiehet Werkossa Workshop 2009). In Germany, there were problems regarding leakage of voting results in advance of official publication (Telegraph 2009). In the United Kingdom, Members of the Parliament were given guidelines for their presence and how to communicate in Twitter (Anonymous, Guardian). Similarly, in Finland, guidelines for the presence of public servants and agencies in the social media services are being developed jointly by a task force headed by the Ministry of Justice (Pitkänen 2009).

In Finland, the Finnish Police Force is one of the government agencies that have received positive attention for its pioneering approach actions. The police are on Facebook[2] and are in fact among most popular Facebook Fan Pages in Finland (Fanilista 2010). The police have also been present for some time in Irc-Galleria[3], an online community popular among the youth and teenagers. In fact, the police claim to "save money", i.e. they reach a rather large population with a fairly small amount of effort, making its online activities a worthwhile investment. (Wirkamiehet Werkossa Workshop 2009).

Thus the presence of government in social media is about more than content, community and Web 2.0 technologies, it is also about the process and presence – engagement (Government 2.0 Taskforce 2009)

3.3.2 Open Government Data

As mentioned in Chapter 3.1.2, key fundamentals of Web 2.0 technologies include the idea of reusable, open data and open interfaces (APIs), so that data from one service can be combined with data from another to create interesting *mashups*. Usually this data is available freely to anyone and without copyright or patents restrictions or other mechanisms of control.

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[2] Suomen poliisi –group, http://www.facebook.com/pages/Suomen-poliisi/134532941512, see also http://www.poliisi.fi/suomi/facebook

[3] http://www.irc-galleria.net, see also http://www.poliisi.fi/irc-galleria

Mashups in the web application context refer to a combination of data or functionality from two or more external sources, often beyond the control of these original sources. Mashups often refer to easy and fast integration of data sources to create new innovative ways of visualizing or utilizing the original data. With tools available for end users to produce new mashup services with little or no programming skills, mashups have become a popular way to produce new services. (Kettula 2009)

In a governmental context, data is being put online to increase transparency and accountability, to improve efficiency and also to contribute valuable information to the constituents. Putting government information online, and making it easily findable, readily available, accessible, understandable, and usable enables new imaginative ways of interaction with the government agencies. (Acar et al. 2009)

Open data also encourages greater public and commercial use and re-use of government information. Open data empowers people: using Web 2.0 and the *Long Tail* (Anderson 2007) principles, new services for even specialized groups can be created by the people, efficiently. (Bennett & Harvey 2009) Even further, it envisioned that open government data creates new innovation and business (Paukku 2009, Acar et al. 2009, Poikola et al. 2010).

However, opening government data for such reuse is not without its difficulties. Challenges in opening government data include issues such as (Acar et al. 2009):

- existing laws, regulations, and policies
- authenticity of the information when it is opened for public use
- how to include electronic communications into the "official record"
- how to integrate new technologies into legacy systems
- how to effectively reach all citizens, including those who access the Web via mobile devices, those with disabilities, or those without any access to the Web

Practical principles and guidance for implementing politics of open data have been suggested by many parties (e.g. Anonymous 2009, Open Government Working Group 2007), and endorsed by political activities around the world (e.g., in the USA by Obama administration (White House 2009).

Eaves summarizes these principles in a brief and understandable way, as the three laws of open data in government (Eaves 2009):

1. If it can't be spidered or indexed, it doesn't exist.
2. If it isn't available in open and machine readable format, it can't engage.
3. If a legal framework doesn't allow it to be repurposed, it doesn't empower.

Some governments have created catalogs or portals of open data they provide. Examples include data.gov[4] (US) and opengov.se[5] (Sweden). In Finland, the Somus project created a list of open Finnish governmental data sources (State Treasury 2009b). This data was used as input in an e-government related mashup competition "*Apps for Democracy Finland*" ("*Kansalaisosallistujan työkalut*"). This mashup competition, for example, created 23 new service ideas and implementations, submitted by individuals, groups, companies and other organizations, and thus served as an example of citizen innovation enabled by open government data. (MindTrek 2009. Poikola et al. summarized the open data discussion and created thorough guidelines for action to public agencies in Finland (Poikola et al. 2010).

The issues and problems of people are not tied to the structures of organizations. Thus open data and the capability to mash up data are important as there are no ways to imagine the needs and wants of the people with regard to digital services, let alone resources to create them all. Enabling and empowering people by means of open data does not mean that all needed applications will be created nor does it free the government from a need to create some services, too. However, it does provide a capability and a certain empowerment, and thus open data helps the government serve its constituents better.

[4] http://www.data.gov
[5] http://www.opengov.se

3.4 Considerations in the Development of E-government Services

When designing digital services in the public sector, it should be noted that development is not typically market-driven but rather there may have some applicable recommendations, best practices or even legal obligations, both technical and non-technical and relating to various parts or points of views in the process. Relevant examples in Finland include the public recommendation JHS 129 ("The principles of designing and implementing Internet services for the public sector") (JHS-section 2005) , Quality Criteria for Web Services (Koskenniemi et al. 2007) regarding the development of the services and the communications recommendations for municipalities (Krogell-Magni 2010) and upcoming social media guidelines (Pitkänen 2009), regarding the presence and actions of civil servants in these services. Other topics of guidelines and recommendations include usability, terminology, metadata, accessibility, copyright, confidentiality and security (State Treasury 2009).

3.4.1 Public Recommendations

A Finnish public recommendation JHS 129 includes some recommendations or metrics how an organization can assess criteria for success in Internet service development. It aids in the design, implementation and sourcing of Internet services and describes the Internet service production process, with an emphasis on the end user interfaces and experience of a good service. While JHS 129 is geared towards e-services, many of its principles can be applied in e-democracy projects as well. (JHS-section 2005)

An Internet service is closely related to the processes of an organization. Thus, the service must have targets that support the organizational goals and are approved by its top management. It should be noted that an Internet service may also cause new types of service needs or dependencies for the service provider, such as helpdesk services. (JHS-section 2005)

A good Internet service benefits the user by saving time, effort or even money. The potential organizational benefits include cost savings or a productivity increase, process or quality improvements. Examples of measures of benefits are (JHS-section 2005) :

- Does the service decrease the amount of routine work done, or the number of errors?
- Do (offline) user inquiries decrease proportionally to user increase?
- Is the issue handling or answering process time decreased?

User benefits, on the other hand, may be measured, e.g., by (JHS-section 2005) :

- Service speed, reliability, price, flexibility, extensiveness, privacy, ease of use
- Benefits may also be measured by estimating or researching the amount of cost and time savings by not having to visit and agency and by doing the tasks at a desired time
- Users may be asked to indicate their perception the usefulness, ease of use, timeliness of data, and service quality

3.4.2 Quality Criteria for Web Services

The ***Quality criteria for web services*** have been authored by the Ministry of Finance, with the purpose to act as a tool for assessing and developing public web services, improve the quality of public web services for both users and service providers and increase the benefits gained from public web services. (Koskenniemi et al. 2007)

The criteria are grouped under five assessment areas: *use*, *content*, *management*, *production* and *benefits*. The quality criteria examine web services from two different angles: the usage and the content of the service are examined from a *user* perspective while the management and service production are examined from the *service provider* perspective. In addition, the criteria evaluate the benefits gained by the user and service provider. These different viewpoints are depicted in the diagram in Figure 5. (Koskenniemi et al. 2007)

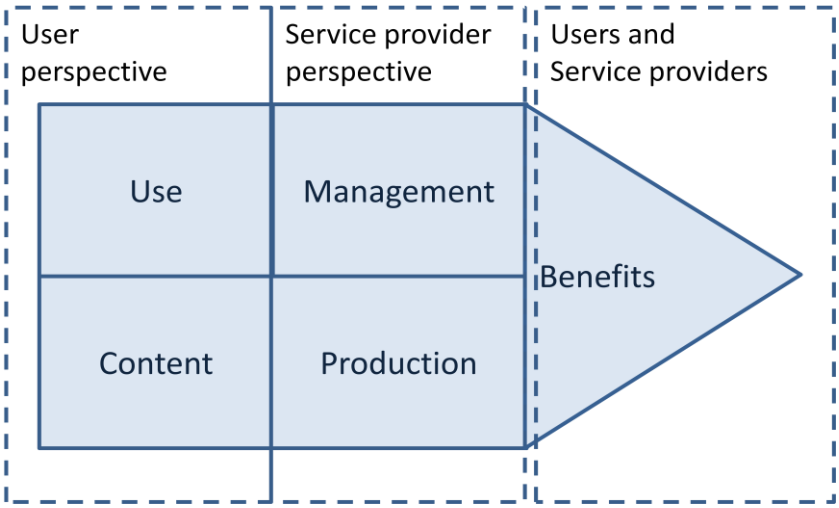

Figure 5: The viewpoints to examining digital services in public administration (Koskenniemi et al. 2007)

It should be noted that the quality criteria do not explicitly take in to account online communities or multi-party collaborations, the viewpoint is that of a user-service interaction.

3.5 Example Social E-government Services

3.5.1 FixMyStreet

The FixMyStreet[6] service in the UK enables citizens to report, view or discuss local problems such as graffiti, fly tipping, broken paving slabs or street lighting, and to track their resolution by the local government concerned. The site was developed by the charity MySociety and was initially funded by a grant from the Department for Constitutional Affairs' Innovations Fund. The site is free to use and no fees are charged to local authorities. FixMyStreet has been in operation since February 2007. Problems reported by citizens to FixMyStreet are sent to the appropriate local government via email. The problem originator is contacted by the service four weeks later to see if the problem has been fixed. At any time the originator or another citizen can post an update which is shown after the original problem post. (King & Brown 2007)

3.5.2 CommentOnThis

CommentOnThis[7] is an experimental site designed to enable detailed discussions around the contents of important public documents. This is a site designed to make it easier to take the core of large published reports can be uploaded to the service and anyone can comment on individual parts of them. (CommentOnThis 2009)

3.5.3 Otakantaa

Otakantaa[8] ("say your view") is a web service run by the Finnish Ministry of Justice for citizens to comment on the starting or ongoing projects, legislative reforms and other current topics of various government agencies.

[6] http://www.fixmystreet.com
[7] http://www.commentonthis.com
[8] http://www.otakantaa.fi

The goal of Otakantaa is to collect views, opinions and expertise of citizens for the projects and other efforts, and at the same time to improve and increase interaction between the citizens. Thus it aims to improve the overall quality of the preparation of various government projects. (Finnish Ministry of Justice 2009b)

The topics in discussion are decided by the government, typically people executing these projects or efforts. Discussions are moderated, but anonymous participation is allowed. A summary of the discussions is written after the discussion period is over and this summary is added to the material for the preparation or drafting of the particular issue (Finnish Ministry of Justice 2009b).

Originally a novel example of citizen-participation, it has no longer been developed in the way internet services in general have and cannot be considered a successful (or modern) service anymore (Finnish Ministry of Finance 2009).

3.5.4 Aloitekanava

Aloitekanava[9] ("initiative channel") initiative is a web service that enables consultation of young people, and thus corresponds to the Youth Act (nuorisolaki). Youth suggest initiatives, which are screened, commented and edited collaboratively. Initiatives are voted on and passed initiatives are sent to the agencies responsible for the particular matter. In the last stage of the process, the lifecycle of ideas (in the official process) is monitored from start to finish. (Nuorten tieto- ja neuvontapalveluiden kansallinen koordinaatio- ja kehittämiskeskus 2009)

Municipalities can also ask for views of young people, who are consulted in current matters. All registered users of Aloitekanava can comment on the issues. The actors asking for youth consultation include various city organizations like councils, boards, committees, organizations, and other citizen groups of young people. (Nuorten tieto- ja neuvontapalveluiden kansallinen koordinaatio- ja kehittämiskeskus 2009)

[9] http://www.aloitekanava.fi

Chapter 4

Business Models of Digital Services: Design and Analysis

This chapter describes key concepts around business models of digital services and e-business. The STOF model, the key framework for this Thesis, is elaborated in detail. In addition, more specific themes and particular considerations of social media and e-government business models are introduced. Interpretations, notes and needed changes to STOF when used in the e-government context are also suggested. Finally, the STOF method, a way to systematically construct a business model, is briefly described.

4.1 Business Models

4.1.1 Definition of a Business Model?

The term *business model* is often used, but seldom explicitly defined. In essence is a description how an entity like company, organization, service or product creates value on the market. Chesbrough and Rosenbloom state that essentially a business model consists of value proposition, *market segment, value chain (internal), cost structure and profit potential, value network (external)* and *competitive strategy* (Chesbrough & Rosenbloom 2002).

Timmers defines business model as (Timmers 1998):

> ”*an architecture for the product, service and information flows, including a description of the various business actors and their roles, a description of potential benefits for the various business actors, and a description of the sources of revenues*.”

There are a number of categorizations for business models. Timmers found ten generic models for electronic markets, albeit for b-to-b trading alone: *e-shops, e-procurement, e-auction, e-mall, third party marketplace, virtual communities, value chain service provider, value chain integrator, collaboration platforms* and *information brokers* (Timmers 1998). Rappa categorizes business models of Internet services into nine different categories: *brokerage, advertising, infomediary, merchant, manufacturer, affiliate, community, subscription and utility* (Rappa 2005). Weill and Vitale offer eight atomic business models for classifying e-commerce Web sites. Instead of trying to specify a comprehensive list of business models, the authors define eight atomic models, on which the particular business models of company, service or product are based on (Weill & Vitale 2001).

Tapscott et al. provide a typology of business models, which they call *b-webs*. They found five generic b-webs, called *agoras*, *aggregations*, *value chains*, *alliances* and *distribution networks*. (Tapscott et al. 2000) These five b-webs are classified according to their degree of value integration (from self-organizing to hierarchical) and their degree of control (low/high) of the value creation process (Dubosson et al. 2002).

As the basis for the STOF model used in this Thesis, Bouwman et al. suggest, based on their literature studies of existing definitions, that (Bouwman et al. 2008a):

> *"A business model is a* ***blueprint*** *for a service to be delivered, describing the service definition and the intended* ***value for the target group****,* ***the sources of revenue****, and providing an* ***architecture for the service delivery****, including a description of the resources required, and the* ***organizational and financial arrangements*** *between the involved business actors, including a description of their roles and the division of costs and revenues over the business actors.*"

4.1.2 Business Models of Social Media Services

As social media services have existed only for a few years, their business models are still emerging and have not yet been academically comprehensively researched.

One common way to gain revenue from social media services is by the means of *advertisements*. Advertisements can often be targeted quite well according to, e.g., end-user profiles or by the content viewed by the end user. Some social media services create revenue by *selling content that has been created by the users*. Often, but not always, the users who create or generate the content sold online get a *revenue share*. An example of this model is Threadless[10].

Social media companies can offer a service free of charge to the general public (for personal or academic use), using the service and gained customer base to boost the technological reputation of the company. The *underlying technology is then sold to enterprises for internal usage*. (Kangas et al. 2007)

[10] Threadless - http://www.threadless.com

A popular business model with social media services is the '*freemium'* model. It is a business model in which basic services are offered for free (or for example supported by advertisements), while users are charged a premium for advanced or special features. It is based on acquiring a lot of customers efficiently through, e.g., word of mouth, referral networks, organic search marketing, and then offering premium priced value added services or an enhanced version of your service to the customer base. (Teece 2010)

Examples of a social media or social networking service is the business networking service LinkedIn[11], in which users who pay get networking and self-advertising features that are not available for non-paying users.

Other applicable business models found in existing social media or networking services include affiliate programs, donations and merchandise sale (Chai et al. 2007).

4.1.3 Business Models of E-government Services

Although there is no clear consensus of what constitutes an e-government business model, and thus no established general classification systems, Janssen et al. found a number of elements useful when applying the concept to e-government business models.

[11] LinkedIn – http://www.linkedin.com

These elements include that an e-government business model (Janssen et al. 2008):

- is derived from the main mission of the public organization, often founded in law
- contains the logic and elements to fulfill the mission successfully using the Internet, and to satisfy citizens and/or businesses
- describes the products, services, and mix of channels
- addresses the relationship between an agency's strategy and information systems
- describes the position in the organizational network and relationships with other agencies that target the same audiences
- describes future evolvement
- is ideally independent of temporary technology

Based on a study of 59 e-government websites, Janssen et al. derived eight e-government business models, which are based on the eight atomic business models (Weill & Vitale 2001), but adapted for e-government. These business models are (a) *Content provider*, (b) *Direct-to-customer*, (c) *Value-net-integrators*, (d) *Full-service provider*, (e) *Infrastructure service provider*, (f) *Market*, (g) *Collaboration*, and (h) *Virtual communities* (Janssen et al. 2008).

In addition to classification of business models, some frameworks for more detailed analysis of e-government business models can be found in academic literature. Bakry has defined a STOPE model for e-government initiatives. It consists of five domains for e-government application business modeling, namely *Strategy*, *Technology*, *Organizations*, *People* and *Environment* (Bakry 2004).

Partially based on the STOPE model and building further, Esteves and Joseph construct EAM ('e-government assessment framework') a three-dimensional framework for the assessment of e-government initiatives, based on maturity level, stakeholders, and STOPE domains (Esteves & Joseph 2008). However, both STOPE and EAM models remain on a high level and provide little or no help in the actual service design process.

4.2 Return On Investment in E-government

Although return on investment (i.e, ROI) is not calculated or even estmated within the scope of this Thesis, it is useful to understand different approaches to calculating value creation on a high level. ROI in IT can be associated with both tangible and intangible benefits, costs, and risks. It is especially difficult to measure and quantify the intangible benefits, costs, and risks, which are sometimes the most important factors for decision-makers. Dadayan compared and summarized six different models of calculating ROI of IT investments in the public sector. (Dadayan 2006)

Social Return on Investment (SROI) model assumes that value creation occurs simultaneously in three ways, ranging from purely economic, to socio-economic and social. *Economic value* is created when there is a financial return on an investment. *Social value* is created when resources, inputs, processes or policies are combined to generate improvements in the lives of individuals or society as a whole. However, it is very difficult to measure the *true* social value created and in the social value arena there are factors that are beyond measurement, yet clearly *are* of value. *Socio-economic value* measurement builds on the foundation of economic value measurement by quantifying and monetizing certain elements of social value, and incorporating those monetized values with the measures of economic value created.

Balanced E-Government Index (BEGIX) is an evaluation tool for e-democracy and e-government services primarily aimed at local communities and emphasizes qualitative performance criteria. It covers five major measurement dimensions (*service portfolio (benefits), efficiency, participation, transparency and change management*) and is based on the Balanced Scorecard approach.

Value Measuring Methodology (VMM) is based on public and private sector business and economic analysis theories and best practices and provides the structure, tools and techniques for comprehensive quantitative analysis and comparison of value (benefits) cost and risk. VMM is based on analysis of *cost, value, and risk* from different perspectives and identifies six essential factors for capturing and analyzing the value created from e-services: *direct customer value; social/public value, government financial value, government operational/foundational value, strategic/political value, and risk.*

Public Sector Value model (PSV) Public Sector Value model provides a baseline for comparing performance of a particular government agency over time and/or compared to other agencies.

Performance Reference Model (PRM) is a standardized framework for measuring the performance of IT investments and focuses on, e.g., mission and business results, customer results, process and activities, and technology.

Interchange of Data between Administrations Value of Investment (IDA VOI) methodology measures monetary benefits to two benefit categories: (1) secure / guaranteed benefits in terms of money, and (2) potential benefits in terms of money, time and quality. The potential benefits assessed in terms of time and quality are recalculated and translated into dollar value for a net benefit calculation.

Demand and Value Assessment Methodology (DAM and VAM) is a merger of two separate methodologies – Demand Assessment Methodology (DAM) and Value Assessment Methodology (VAM), and assists government agencies to assess demand and value proposition for e-government programs.

It has been argued that the probability of obtaining a positive return in IT investment depends on the type of IT investment. ROI in IT as a *strategic application* will be different from ROI in *transformational* IT. It is easier to estimate a range of possible costs, benefits and risks, and probability of each in the case of strategic IT investment. It is much harder to estimate the costs, benefits and risks associated with transformational or innovative IT investments as often they change the nature of company, the industry, and even the way people live and work. (Lucas 1999)

4.3 STOF Model and Its Adaptation to Collaborative E-government Services

Based on other business models and business model frameworks, Bouwman et al. introduce a holistic model for describing the business models of electronic services, called the *STOF model*. STOF hides complexity of many other models into four core components, or *domains*: namely *Services*, *Technology*, *Organization* and *Finance*, as depicted in Figure 6. Although originally developed for mobile services, STOF model can be and has been used in the context of various kinds of digital services. STOF also provides a means to analyze and develop the business models of a service over time, as the service develops from an initial concept to a service in the market. (Bouwman et al. 2008a)

This section introduces the STOF model and an adaptation of it for the context of e-government and social media. Presented interpretations and modifications to STOF are based on the previous literature study of special characteristics of social media services and e-government, and existing recommendations and quality criteria.

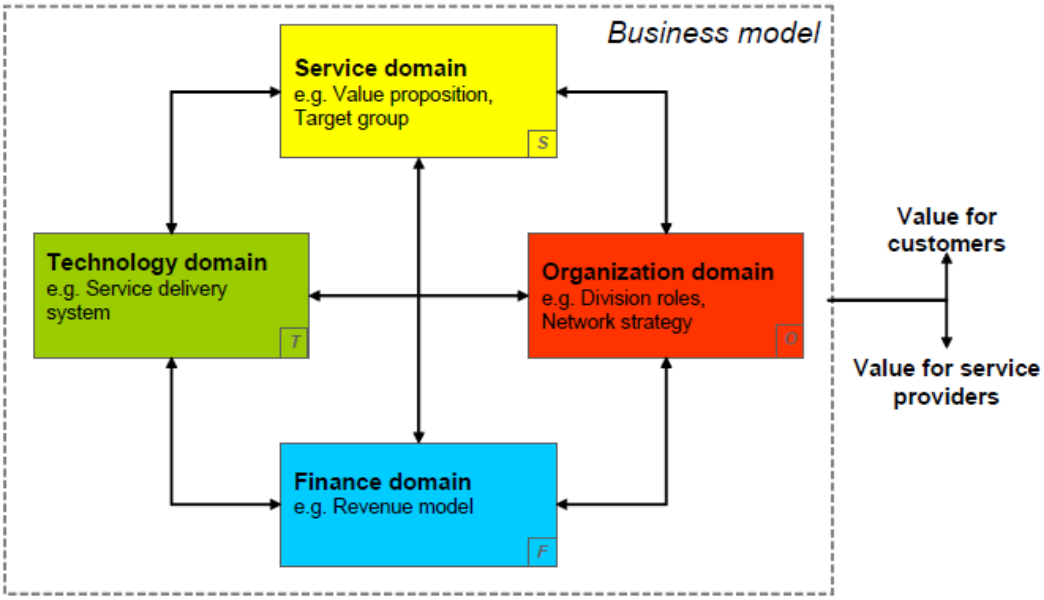

Figure 6: STOF model overview (Bouwman et al. 2008b)

4.3.1 Service Domain

In STOF, the starting point for any business model should be the *customer value* of a product or service that an individual company or network of companies has to offer and which will satisfy customer demands. As the customer value of the service is the most relevant aspect of the service, it serves as the reference when comparing to the other domains. (Bouwman et al. 2008a)

Thus, value is subjective to the customer (or end-user). The provider of the service will not be able to serve all customers with the same experience of value. The concept of value is broken down into four subconcepts: *intended value, delivered value, expected value* and *perceived value*. (Bouwman et al. 2008a)

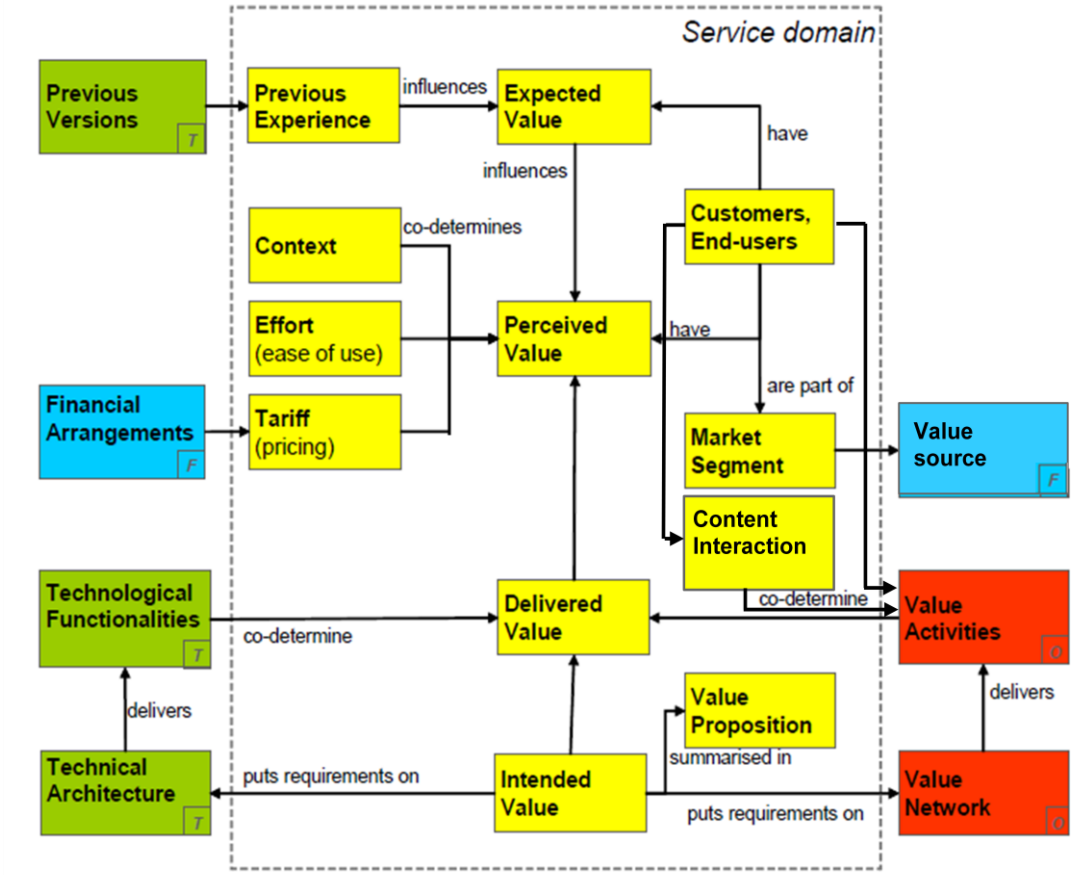

Figure 7: Modified STOF *Service* domain (adapted from Bouwman et al. 2008b)

Intended Value is the value a service provider is intending to offer to customers or end-users and is often equated with *value proposition*. *Delivered Value* is the value a provider actually delivers to customers or end-users of the service. It is affected by technological functionality, but also by value activities (see Section 4.3.3 Organization).

Expected Value is the value a customer or end-users expect from the service, based on their experience with *previous versions of the service* or with similar or alternative services for the same purpose. Furthermore, resources and capabilities, like trust and reputation, and by financial arrangements, such as possible fees for service usage affect expected value.

Perceived Value is the value a customer or end-user actually perceives when consuming or using the service, and defined as the difference between *Delivered Value* and *Expected Value.* Perceived value is user-specific and can only partially be controlled by the service provider (network). (Bouwman et al. 2008a)

In collaborative e-government services, it can be argued that examples of items that affect the perceived value but are beyond the control of the service provider in include the *content interactions* and online behavior of the user community.

The term "*customer*" is used to refer to the person or organization paying for the service, while "*end-user*" to refer to the person(s) actually using the service. These are in fact often separate entities: e.g., "customer" may refer to a particular government agency or organization paying for a service, while there may be different types of "end-users". In e-government services, end-users may include the stakeholders (Esteves & Joseph 2008) of e-government, including civil servants of the customer organization, other government agencies, special interest groups or citizens of a city or nation.

Context can be defined as any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves. (Dey 2001) Context can refer to static attributes (like personal characteristics) or dynamic attributes (like location). A service is always used within a specific context. (Bouwman et al. 2008a)

Customers may pay a *Tariff* (price) to use the service, and end-users make an *Effort* to use the service. *Effort* refers to all non-financial efforts the end-user must make to use a service. Typically, in public services, there is no direct tariff paid by end-users in the same sense as when buying/purchasing a commercial service. Organizations (which may be in the role of a customer) may however pay a tariff (in various forms). There are *efforts* involved in using public services, including effort to discover a service as well as effort to learn to use and actually use the service.

Bundling of services or products is a common practice in the mobile telephony industry, which in general leads to increased value of services to the customer or end-user, but may be not be relevant in the context of social media e-government services, and is removed from the STOF model.

Especially digital services based on social media and participatory economics by definition do not have value built into the service itself without the user community or content. Thus, to provide the value to users, the service needs to build the *community*, which in turn created or modifies the content in the service through *content interactions*.

4.3.2 Technology Domain

Requirements as defined in the Service domain (esp. Intended value) determine and specify the *Technical Architecture*, which is a key element of the Technology domain, depicted in Figure 8.

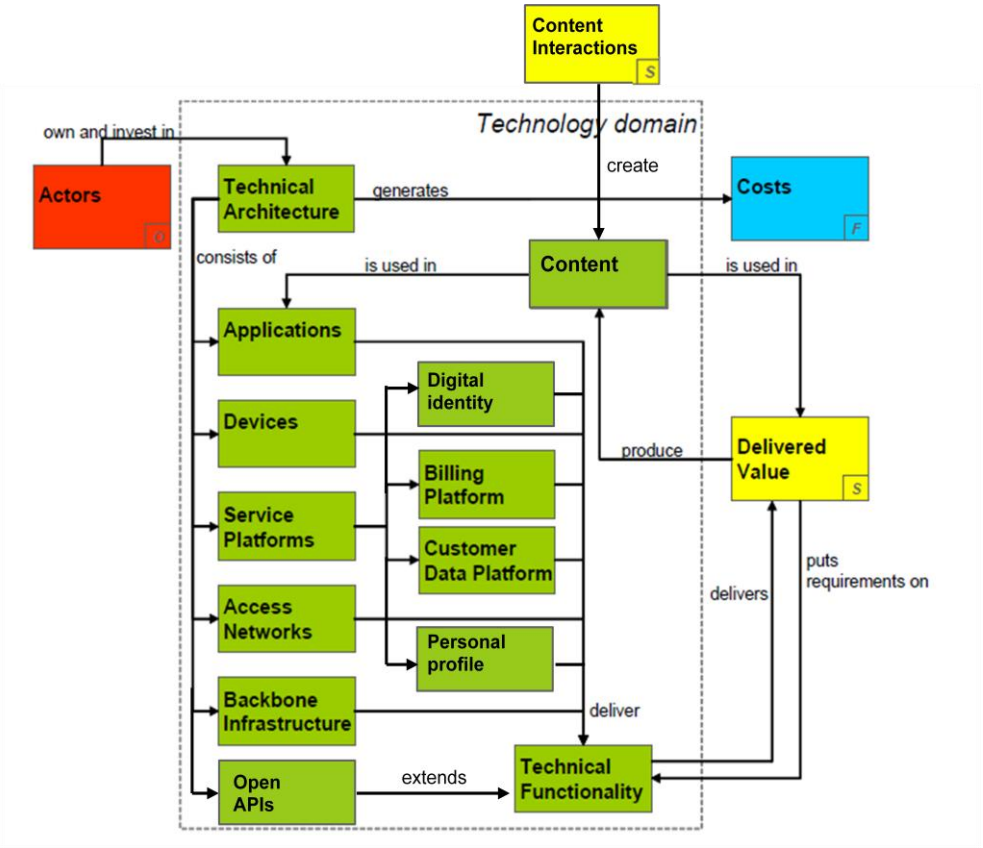

Figure 8: Modified STOF *Technology* domain (adapted from Bouwman et al. 2008)

Technical Architecture describes the overall architecture of the technical components. Important characteristics of the technical architecture include: centralized vs. distributed, open vs. closed, interoperable vs. non-interoperable (Bouwman et al. 2008a). Social media and e-government services are should strive to implement and interoperable and open technical architecture, as much of the value from the data and content in a service may actually be generated outside the actual service, through mashups. Technology architecture of a service may, for example, provide interfaces through *open API*s with common technologies like XML, REST and SOAP or with, e.g., RSS feeds. Interfaces should be provided for interchange of data related both to content as well as interactions.

The technical architecture should also provide a means to link to individual elements of data content within the service, using *permalinks*, i.e., a permanent URL.

STOF approach to data is mostly about physical data transfer and storage. In STOF, *Data* refers to the data streams transferred over networks, with important characteristics being: *asynchronous vs. real-time, high volume vs. low volume* (Bouwman et al. 2008a). However, much of the meaning, especially in social media and collaborative e-government services, is stored in the *content,* not data. Engeström claims that it is actually content objects that provide the meaningful link between people, and calls these content objects *social objects*. Social objects can be claimed to have an effect on the success of social media services. (Engeström 2005)

Backbone Infrastructure and Access Networks refer to the data communications infrastructure, including mobile telecommunications networks and broadband Internet. Varying characteristics in the infrastructure of the end-users should be taken into consideration when designing services. *Service Platforms* refers to middleware platform functions such as *Billing* and *Customer Data Management*. These platforms provide the generic business functions as authentication, billing and customer care. Other specific platforms may offer for instance location or context information. (Bouwman et al. 2008a)

Customer data platform may refer to CRM-like information about citizens and may or may not be relevant, depending on the type of service. One important item in e-government is the concept of *digital identity* management, on various levels. Interoperable identity management improves usability (i.e., lowers effort) and provides a mechanism for personalization. As mentioned in Chapter 3.2.5, personal profiles are one important and common way to increase the sense of community, which is one of the motivators for participation.

Devices refer to the end-user devices providing access to services. Important characteristics are: multi-purpose vs. single purpose, "network intelligent" vs. "dumb interface", storage facilities vs. no storage facilities, embedded software vs. open terminal. In e-government services, there may be recommendations or even legislation regarding the technology needed by end-users to use a service. In general services should run on a range of devices and be easily accessible to citizens, to promote equal access and participation. There are some legal constraints and public recommendations (JHS-section 2005, Koskenniemi et al. 2007, Chisholm et al. 1999) about accessibility that developers should be aware of.

Applications refer to the user applications running on the technological system. Important characteristics are: *communication vs. content, always on vs. time-critical, personalized vs. non-personalized, secure vs. non-secure*. In the scope of the Thesis, important characteristics include *content* and *community*. Social media services are a combination of content and communication and typically have support for personalization.

Technical Functionality refers to the characteristics of the technological system such as: always on vs. time-critical, personalized vs. non-personalized, secure vs. non-secure.

4.3.3 Organization Domain

Organizational issues revolve around the resources and capabilities, mainly related to technology, marketing and finance that have to be made available to enable the service. Even if one organization provides the service, it typically needs to collaborate with other organizations to be able to provide the needed resources and capabilities. (Bouwman et al. 2008a) However, promoting collaboration with Web 2.0 and social media changes the ways and the culture of organizations, meaning that resources and capabilities may be related to other organization functions than the abovementioned. The *Organization* domain of STOF is shown in Figure 9.

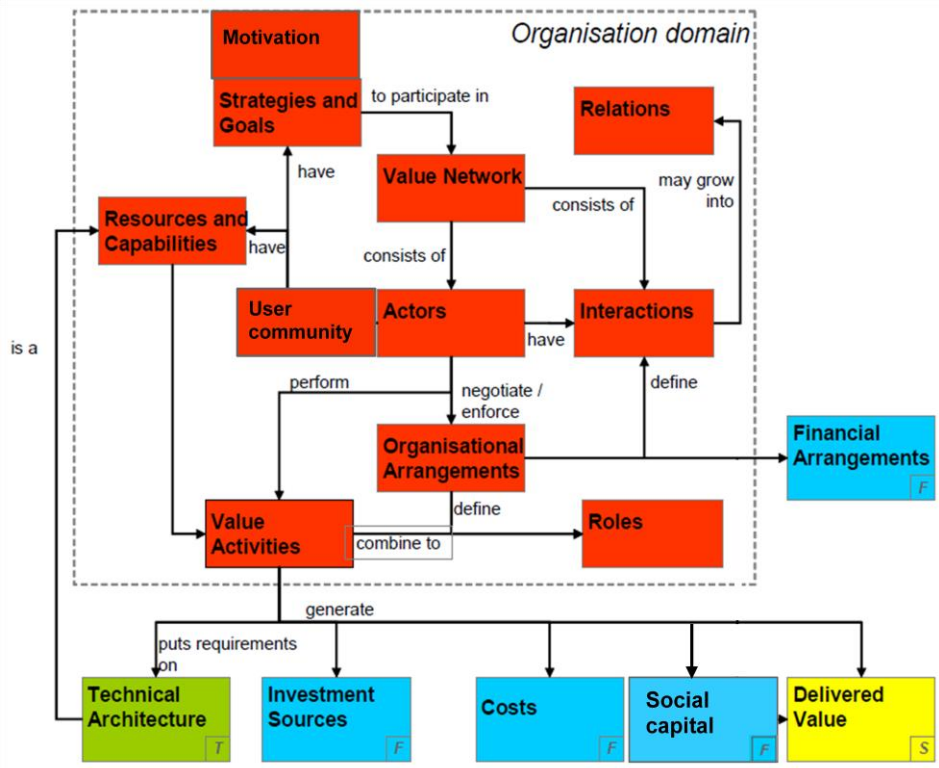

Figure 9: Modified STOF *Organization* domain (adapted from Bouwman et al. 2008b)

The *value network* consists o*f actors, interactions* and resulting *relations between the actors.* Relationships build trust and commitment within the network and are an important aspect of a value network.

There are three basic types of partners in a value network: structural partners, contributing partners and supporting partners with varying degrees of power within the value network, based on their resources and capabilities. Structural partners have the most power in the network, but they also invest resources for later revenue gain. Contributing and supporting partners, on the other hand, may get compensation for their resource investments immediately. (Bouwman et al. 2008a)

In the e-government context, actors, or stakeholders, are typically citizens, employees, businesses, governments, IS/IT personnel and special interest groups (Esteves & Joseph 2008). In social media services, the *user community* could be also argued to be a structural partner, as it produces most of the *content* and *social interaction*s and thus effectively much of the value in the service.

Collaborating actors have varying *strategies* and *goals*, which need to shared, requiring trust between partners. Members of the user community have *motivation* to use the service, which is similar but distinct from the organizational goals and strategies. Collaboration leads to complex interdependencies and *organizational arrangements* between organizations, because typically no single partner has formal authority over another partner.

Value Activities are the activities that an actor performs in order for the value network to deliver the proposed service. Value activities can be seen as costs but also as a source of investment. In social media services, value activities include *content interactions* (e.g., creation and editing of content) and thus value activities are not just the activities of service provider organizations.

In social media services (and likewise in any peer production or produsage-.based services), the role of customers do not just consume or interact with a service, but also to take part in the production process. In fact, end-users (i.e., user community) themselves are (an integral) part of the production process, value activities and value network. (Bruns 2007)

Value activities related to providing the service *infrastructure* (Technology) are typically by made by organizations and governed by various agreements. However, value activities related to actual *usage* of the service (including user-creation of content) are related to individuals and often not enforced by agreements. This means that the *motivation* of the users is vital to the execution of value activities. Value activities, like users forming connections and interactions with others in the user community create *social capital* (Ellison et al. 2007).

Resources and Capabilities can be financial, social, organizational and technical in nature. *Relations* evolve over time, as trust and reputation are built. Relations are relevant not only between the organizations in a value network, but also between all stakeholders. Trust creates one form of lock-in in a community (Hagel & Armstrong 1997).

4.3.4 Finance Domain

A fair division of costs, revenues and investments is required to make the collaboration worthwhile for all the organizations in a value network. In addition, the revenue mechanism for customers and/or end-users needs to be defined. The Finance domain, which deals with these aspects of service design, is depicted in Figure 10.

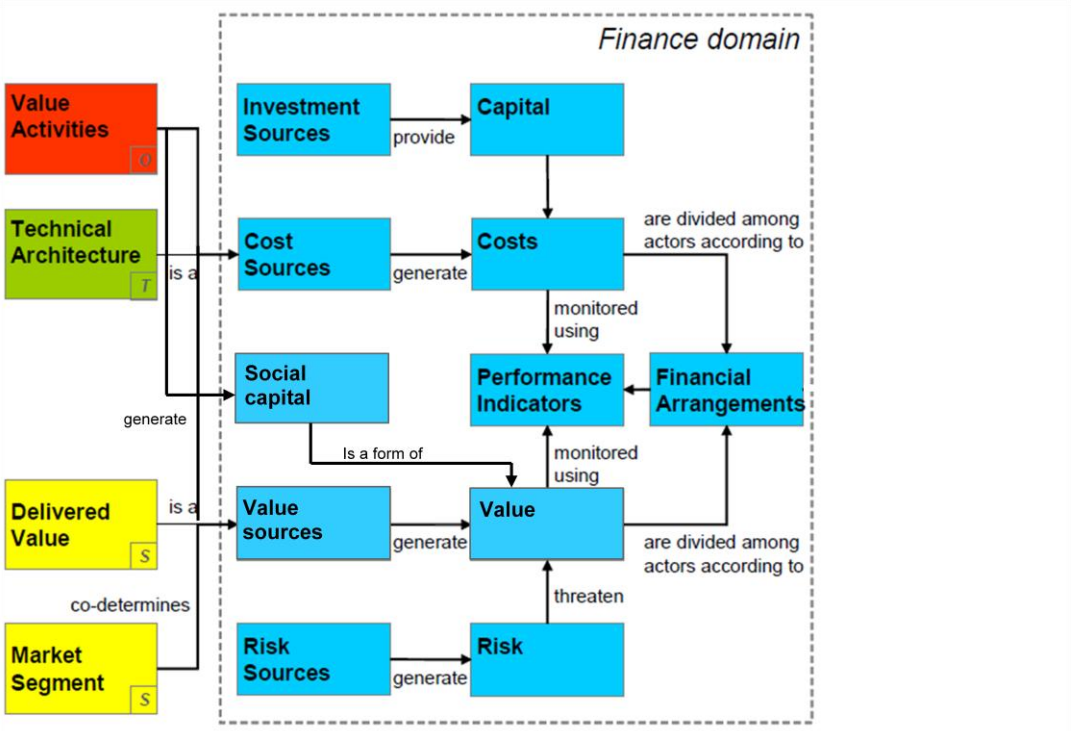

Figure 10: Modified STOF *Finance* domain (adapted from Bouwman et al. 2008)

Investment sources. The investments and costs of implementing and operating the service are related to the design choices made in the technology design and the question who will supply *Capital* to cover the various *Costs.*

Costs are derived from various *Cost sources*, including for example technical architecture, value activities and general coordination of the value network.

Bouwman et al. introduce market adoption, usage, revenue and return on investment as examples of *performance indicators* to help the service provider(s) evaluate and manage financial arrangements over time (Bouwman et al. 2008a). Fong divides measures of success into *input measures*, *output measures*, *short-term outcomes* and *long-term outcomes*. Input measures include time and money associated with the development and operation efforts. Output measures are, for example, downloads, time spent on a website and number of transactions; short-term outcomes includes adoption rates, accessibility, accuracy of information and ease of use. Long-term outcomes include cost-savings, staff-savings and trust in government. Another set of measures is suggested as reach, relevance, packaging, access and collaboration, quality and operations. (Fong & Meng 2009)

STOF defines *Revenues* and *Revenue sources*, coming directly from the end-users or indirectly, for example from subscriptions, advertisements or government subsidies. For collaborative e-government, *value* and *value source* are used instead, to highlight the fact that the benefits (value created) are sometimes difficult to quantify.

Risk sources. The risks existing in other domains may have financial consequences. The way the value network copes with the uncertainty and possible financial consequences of the various risks when they are actualized needs to be defined. Risks in e-government services include: performance risk, privacy risk, financial risk, time risk, and social risks (Rotchanakitumnuai 2008). Governments may also try to avoid legal risks, although it is suggested that risks should be weighed against possible benefits (Government 2.0 Taskforce 2009).

The *price* and the *pricing* structure is typically the most visible part of the financial arrangements to the end-users in most commercial services. However, in an e-government context, it is unlikely that a citizen end-user will pay a price.

Finally, the *financial arrangements* between the actors in the value network describe the way profits, investments, costs, risks and revenues are shared among the actors.

4.3.5 Critical Design Issues and Critical Success Factors

While the STOF model in itself serves well as the model the domain of the service, success designing a viable business model for a service is based on understanding *critical design issues (CDI)* and *critical success factors (CSF).* A viable business model should create *value for customer* and *network* alike. Value creation for business actors (*network value*) is complex due to the varying and perhaps conflicting strategic interests of organizations in the network. Although design choices in the technology domain should satisfy the requirements of the service domain, not every solution will be affordable, thus there are also interdependencies between the technical and financial domains. (Bouwman et al. 2008a)

CDI is defined as a design variable that is seen by the practitioner and/or researcher to be crucial to the viability and sustainability of the business model under study. The CDIs found by Bouwman et al. are based on a number of case studies, but may differ according to the case in question. (Bouwman et al. 2008a)

CSFs, on the other hand, refer to "*the limited number of areas in which satisfactory results will ensure that the business model creates value for the customer and for the business network*". CSFs are based on CDIs and iteratively refined to create a viable business model, as illustrated in Figure 11. (Bouwman et al. 2008a)

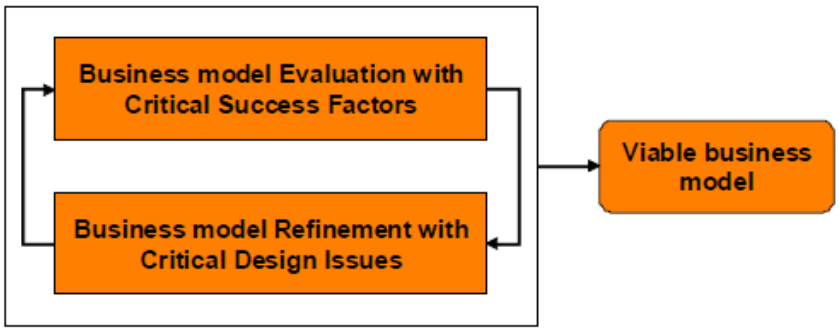

Figure 11: The relationship between CSFs and CDIs to create a viable business model. (Bouwman et al. 2008b)

4.3.5.1 Critical Design Issues

Critical Design Issues (CDIs) in the Service domain of the STOF model are: *targeting, creating value elements, branding, and customer retention.* In addition, the following CDIs are defined collaborative e-government services: *acceptable user community, user activation* and *sense of community*.

These CDIs are summarized in Table 1.

Table 1: CDIs in the *Service* domain

Critical design issue	***Strategic issue***	***Note***
Targeting	Businesses vs. individual users	Not necessarily 'all citizens' even in e-government context
Creating value elements	Ease of use vs. added value	End-users also take part in creating value elements
Branding	Using existing brand vs. rebranding	Public vs. private brand
Customer retention	Customer lock-in vs. customer annoyance	Removed: Not applicable as a critical design issue
Acceptable customer base	Needed base for gaining benefits	Not always applicable as such, see also acceptable user community
User activation	Positive mechanisms vs. annoyance	Notifications of interesting content or interactions, as an example
Acceptable user community	Gaining a critical mass of contributors to the user community	A large enough user community is needed for mass collaboration to work (e.g., 90-9-1 rule)
Sense of community	Encouraging recurring participation and building of social capital	Not all collaborative applications need a sense of community, but it will help in motivation

Critical Design Issues (CDIs) in the technology domain of the STOF model are: *security, quality of service, system integration, accessibility for customers, and management of user profiles*. In addition, mechanisms for *content reusability* are added as a CDI. These are summarized in Table 2.

Table 2: CDIs in the *Technology* domain

Critical design issue	***Strategic issue***	***Note***
Security	Ease of use vs. abuse and privacy	
Quality of Service	Quality vs. costs	End-users with widely varying technical infrastructure
System Integration	Flexibility vs. costs	Integration of systems and data, also with systems out of control of service provider
Accessibility for Customers	Open vs. closed system	Legal and moral accessibility guidelines and recommendations, ease-of-access, context incl. Mobile
Management of user profiles	User involvement vs. automatic generation	Personal identity management, photos, rewarding mechamisms and other features
Content reusability	What content/interactions are available through API's	Value can be created outside the particular service, reuse of content and interactions should be promoted

Critical Design Issues (CDIs) in the organization domain of the STOF model are: *partner selection, network openness, network governance, and network complexity*. In addition, the CDI *social interactions* is added. Social interactions refer to interactions related to the content, but also networking, and interactions between the various stakeholders in the service value network.

Summary of the CDIs in the organization domain is in Table 3.

Table 3: CDIs in the *Organization* domain

Critical design issue	***Strategic issue***	***Note***
Partner Selection	Access to critical resources and capabilities	Open access, but structural organizations needed
Network Openness	Desired exclusiveness, control, and customer reach of service	Collaborative services typically open by definition
Network Governance	Customer ownership and control over capabilities and resources	Formal governance of collaborative network may not be possible
Network Complexity	Controllability of value network and access to resources and capabilities	Collaborative network may not be controllable
Social interactions	What kinds of interactions between stakeholders and users are possible?	Content interactions, networking interactions. Differs from the definition of "interactions" in the STOF organization domain.

Critical design issues in the Finance domain of the STOF model are: *pricing, division of investments, division of costs and revenues, and valuation of contribution and benefits.* In addition, a CDI *participation rewards* is needed. Participation rewards refers to all mechanisms, typically monetary, of rewarding users and encouraging recurring participation.

Summary of the CDI's in the Finance domain is in Table 4.

Table 4: CDIs in the *Finance* domain

Critical design issue	***Strategic issue***	***Note***
Pricing	Realizing network profitability and market share	Typically not applicable for citizens, may be applicable for agencies
Division of investments	Match individual partners' targets and risk profiles	Monetary and resource investments
Valuation of contributions and benefits	Fair division of costs and benefits	
Division of costs and benefits	Balance between individual partners' benefits and network benefits	
Participation rewards	Rewarding users to encourage participation	Non-monetary ways, e.g., gain of reputation

4.3.5.2 Critical Success Factors

Critical success factors, or CSF's, refer to those limited number of areas in which satisfactory results will ensure that the business model creates value for the customer and for the business network. In the STOF method, critical success factors are examined from *Customer Value* and *Network Value* points of view. (Bouwman et al. 2008a). However, considering that most of the users in collaborative e-government services cannot be considered *customers*, the customer value in STOF is renamed to *user value* and in this meaning refers to a user from any of the possible stakeholders.

The CSFs in creating **user (customer) value** are *Clearly Defined Target Group, Compelling Value Proposition, Acceptable Quality of Service Delivery amd Incentives for Participation.*

These CSFs and the CDIs affecting these CSFs are depicted in Figure 12.

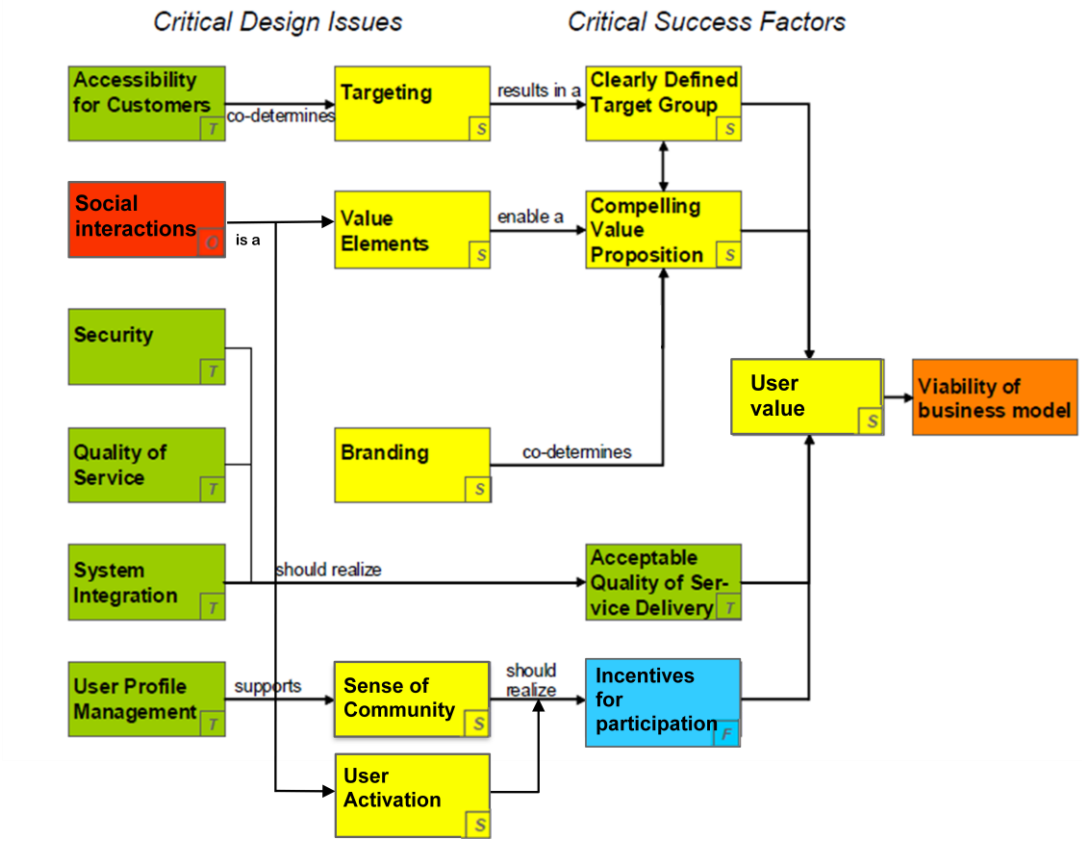

Figure 12: Critical Design Issues and Critical Success Factors in creating *user value* (adapted from Bouwman et al. 2008b)

Compelling Value Proposition is the very fundamental requirement in creating customer value. A value proposition refers to the benefits that are delivered to the user of a service, from the point of the view of the customer, not possibilities of technology.

Successful services also need a *Clearly Defined Target Group* as all customers cannot be treated individually, and neither will services suit the requirements of all users. Even in the e-government context, the target is not necessarily 'all citizens' but may be particular groups, just as in commercial services.

An acceptable *Quality of Service Delivery* (technology domain) in STOF consists of the quality of the service process (functional quality) as well that of the service outcome (technical quality), both of which are important. It should be noted the quality experienced is not only a matter of the service provider, but also of the way the user community interacts and provides some of the value elements to the user, but this view is not defined in this CDI.

Commercial services often have customer retention mechanisms, i.e., marketing strategies aimed at keeping customers satisfied and loyal must not frustrate the users or lower ease-of-use. In collaborative e-government services, the meaning is slightly different, as there is, for example, competition in the same way. However, users must have a reason to participate, hopefully repeatedly, in the service. Thus *Incentives for Participation* must be in place. Incentives do not refer to monetary mechanisms. It may refer to some ways of rewarding the users for their participation. Examples include explicit awards, merits, points, but also implicit issues like increase in reputation.

The CSFs related to **creating network value** in STOF are *acceptable profitability*, *acceptable risks*, *sustainable network strategy*, and *acceptable division of roles*. In collaborative e-government, acceptable profitability can be restated as *satisfactory benefits*, with the assumption that these benefits are somehow evaluated with proper mechanisms, quantitative or qualitative. Different kinds of measures (see e.g., Fong & Meng 2009) should be evaluated.

This CSF is affected by division of costs and gaining an acceptable user community. All parties should acknowledge the risks in IT initiatives, and division of investments should be allocated accordingly. Failure rates of e-government projects are estimated to be as high as 85% (Heeks 2001). A sustainable network strategy is needed to secure access to resources and capabilities and is influenced by the CDI Sustainable Network Governance.

Finally, among the network complexity and partner selection affect *acceptable division of roles*. With the network value CSFs well in place, it is likely that a good 'win-win' situation among all the actors have been achieved. The CSFs and the CDIs related to them are depicted in Figure 13.

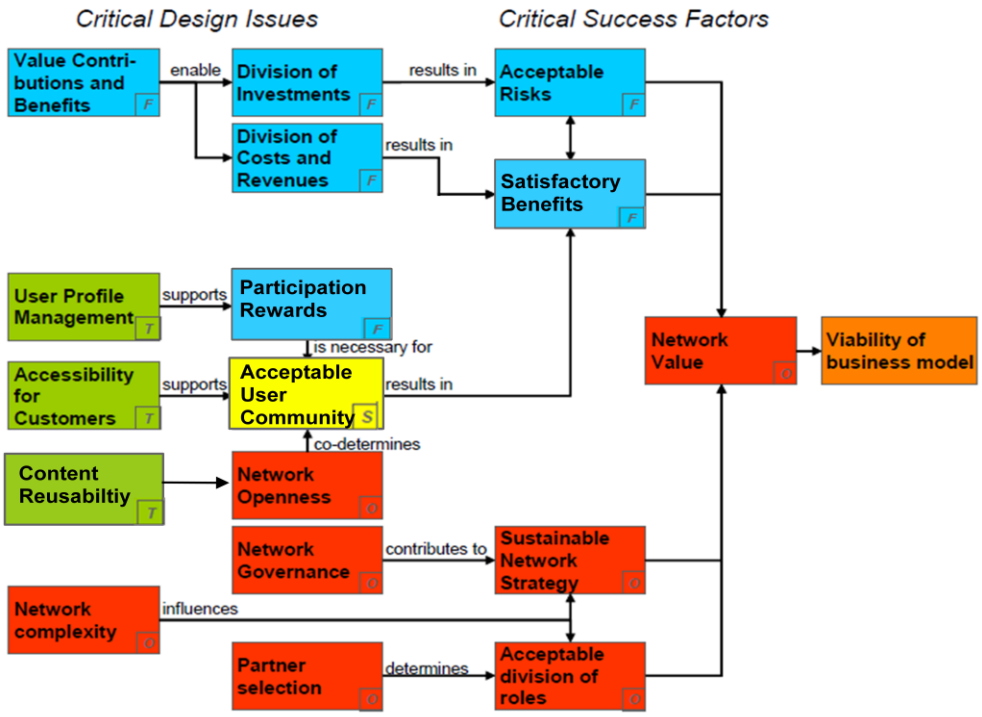

Figure 13: Critical Design Issues and Critical Success Factors in Creating Network Value (adapted from Bouwman et al. 2008b)

4.4 STOF Method

The STOF method explicitly helps designers to create viable, feasible and robust business models that create value for customers and providers alike. The method is especially useful in the early stages of service innovations: the exploration and initial elaboration of various ideas and options. When the method is used at an early stage, the service and technology design can be adjusted to satisfy the business requirements and increase market potential at a later stage.

The STOF method (see Figure 14) consists of four steps.

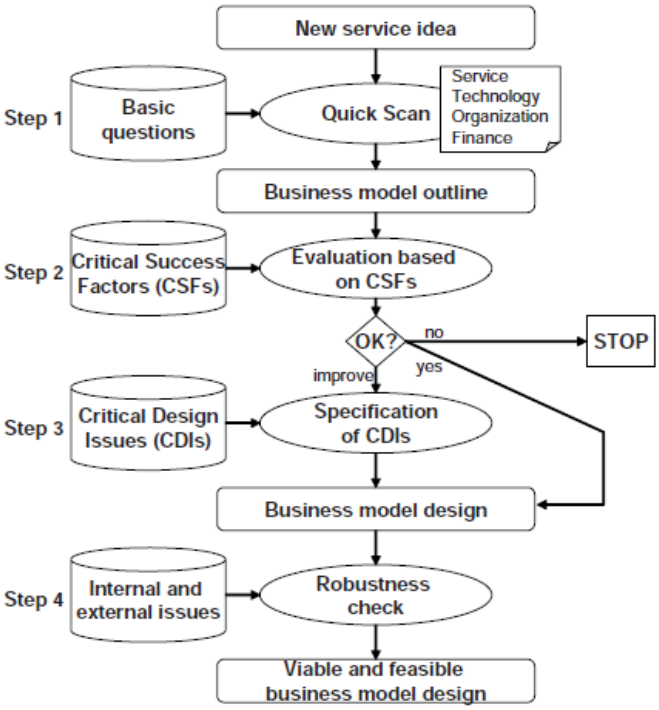

Figure 14: STOF method outline (Bouwman et al. 2008b)

In the *Quick Scan* phase, a rudimentary business model is developed, which includes aspects from the four domains of the STOF model. The Quick Scan focuses on design choices for design variables in the descriptive domain models. The Quick scan in the STOF method is in itself a rather detailed set of over 100 questions covering the four STOF domains.

Before moving on to the next stage, fine-tuning between the domains is relevant, using the questions in Figure 15.

	Service domain	Technology domain	Organization domain
Technology domain	Can the technology design deliver the value proposition?	-	-
Organization domain	Is the value network able to deliver the service and its value proposition?	Does the value network match the technology architecture?	-
Finance domain	Are service fees in line with the value proposition?	Are the estimated investments regarding implementation realistic?	Has a win-win situation been achieved?

Figure 15. Balancing the requirements between domains (Bouwman et al. 2008b)

The *evaluation* of the Quick Scan design looks at how well the business model satisfies the CSFs for business model viability. The CSFs are related with creating value for end-users (customers) and service providers. The underlying logic is that a negative assessment of certain CSFs implies that there will be bottlenecks in the business model's viability, and that CDIs related to such CSFs should be redesigned. (Bouwman et al. 2008b)

Next, a selected set of CDIs is *specified in greater detail*, depending on the evaluation of the CSFs in step 2. Finally, the *evaluation* and *robustness checks* examine the performance of the business model in extraordinary conditions. Issues to consider include modularity, lock-in, technology changes in the market, explosive increase in demand and unexpected customer segment appeal. (Bouwman et al. 2008b)

Chapter 5

Research Cases

This chapter presents the two researched cases in detail, i.e., the STOF analyses and other findings.

The STOF method was applied in the Fillarikanava case using desk study, findings from a live pilot phase, interviews with the customer and stakeholders, and workshops with customer organizations. Participation in the workshops was found to be very insightful as the service is live and used actively by citizens and is being piloted by the government (City of Helsinki) users, meaning that concrete issues could be raised, at a very practical level.

The KommentoiTätä case was studied using desk study, interview with a customer organization, lightweight piloting and real-time usage tests during a workshop.

The focus of analysis is from the perspective of the service itself, not from the point of view of the application developer or service providers.

5.1 Fillarikanava

Fillarikanava (”The Bike Channel”) is a service in which the City of Helsinki is piloting a new kind of open and direct dialogue between citizens (bikers) and the administrative workers. Interested participants (such as bikers) can discuss about issues related to the biking conditions in Helsinki – including maintenance-related issues, such as unclear or missing road signs or loose sand on the biking routes, as well as more long-term concerns, such as dangerous intersections, priorities in building new biking routes, etc. City personnel who are responsible for the planning and maintenance of roads or biking paths follow the online discussions of the service and participate in the discussions, as agreed or seen necessary.

The goal of Fillarikanava is that the City benefits from information produced by the citizens – i.e., knowledge and information are crowsourced from the biker community is effectively communicated to the City personnel. Knowledge is built openly and constructively. On the other hand, when answering questions the public servants reach an interested audience easily. Ideally, when designing new traffic solutions or prioritizing maintenance activities, citizen comments are taken into consideration. The City of Helsinki has stated that digital services for feedback and citizen engagement are among its spearhead projects for 2007-2010 (City of Helsinki 2007), so there is a good buy-in in the piloting organization. The Fillarikanava front page is shown in Figure 16.

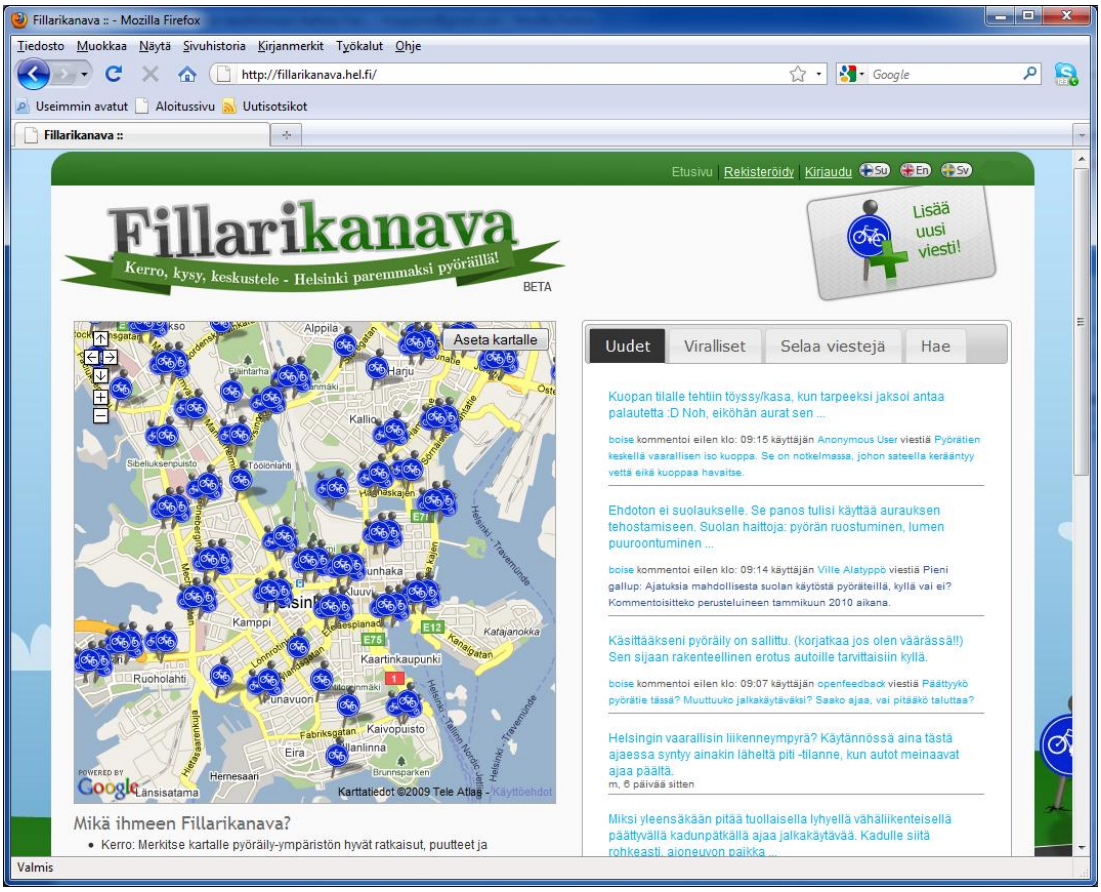

Figure 16: Fillarikanava home page

5.1.1 Service

The key market segment for end-users is essentially all bikers in Helsinki. The customer of the service is the City of Helsinki (City) and its particular departments, the City Planning Department (KSV) and Public Works Department (HKR). A Fillarikanava trial has been bought by the city and during piloting it is coordinated by the Economic and Planning Centre (TASKE). City officials are also users of the service, in particular people in charge of biking lane maintenance (Public Works Department) and biking lane planning and building (City Planning Department).

City officials use Fillarikanava in the context of

- wanting to start dialog with users (consultation from users)
- engaging in dialogue with users (answering feedback)
- using the service for allocating work tasks, in maintenance
- using the service as input for planning
- informing the users about some issue

The service presents a new kind of open process between the various city organizations and citizens. In addition to citizen engagement being itself an important value, there is reasoning that this process will benefit both city organizations and citizens. This is a kind of crowdsourcing of issue feedback that will help the City, e.g., prioritize activities in both planning and maintenance. The citizens will be benefited by having a joint channel to express views, seeing replies to other queries, and perhaps even shaping city activities and planning according to expressed concrete needs.

The slogan of the front page, "Tell, ask, discuss Helsinki into a better biking city", has in itself certain value proposition explicitly and implicitly expressed. This statement can be interpreted that by contributing to the Fillarikanava service, the biking conditions of the city will be improved. The statement is a call to engage, communicate and participate, and it could qualify as a reasonable "plausible promise".

In addition, the home page states, more particularly, that users can:

- inform (mark on a map) good solutions, deficiencies, and dangerous places
- leave suggestions or ask – with the promise that other bikers or city personnel can participate in the discussion
- discuss – read, comment and vote others' suggestions and answer others' questions

There are no previous versions of this service (or a very similar service) deployed in Helsinki, that affect the expected value. For the citizens, likely comparisons of previous experience include:

- other city (and e-government) web services
- other participatory or crowdsourcing-based services on the web services
- other ways of participation and giving feedback (e.g. e-mails, surveys, phone calls and other offline complaint or feedback methods)

Fillarikanava is offered as a service under the hel.fi domain by the city of Helsinki in cooperation with other parties. Being affiliated with the City probably also has some implicit expected value assumptions. End-users will expect the city employees to engage in the service as well and to give "return on investment" they've made by giving their effort to give feedback. Thus, making sure the users feel they are heard and reporting back is an important success factor of the service.

For city employees, the key comparison is probably to other IT systems in use by the city. City employees also have experience in their interaction with citizens via other channels, which likely includes, e.g., e-mails, surveys and face-to-face meetings.

For Fillarikanava, there are no user activation mechanisms for promoting recurring usage. While there are no competing services offering the same type of value proposition, failure to satisfy users may cause users to return to old feedback mechanisms. Mechanisms are needed to stimulate users and this is clearly missing.

The content in itself is interesting, there is also plenty of it, it could be said that there is an *acceptable user community*. Interaction is possible in some ways, but content searching, filtering, ranking, for example, are missing. There is no or very little *sense of community*, as there are no user profiles or rewading mechanisms. Users must be instrinsically motivated, although the feedback and comments from City personnel are likely to motivate users.

Figure 17 demonstrates a particular example with discussion about possible future development after a new legislation development. An uploaded image is used to make the point clear to other users.

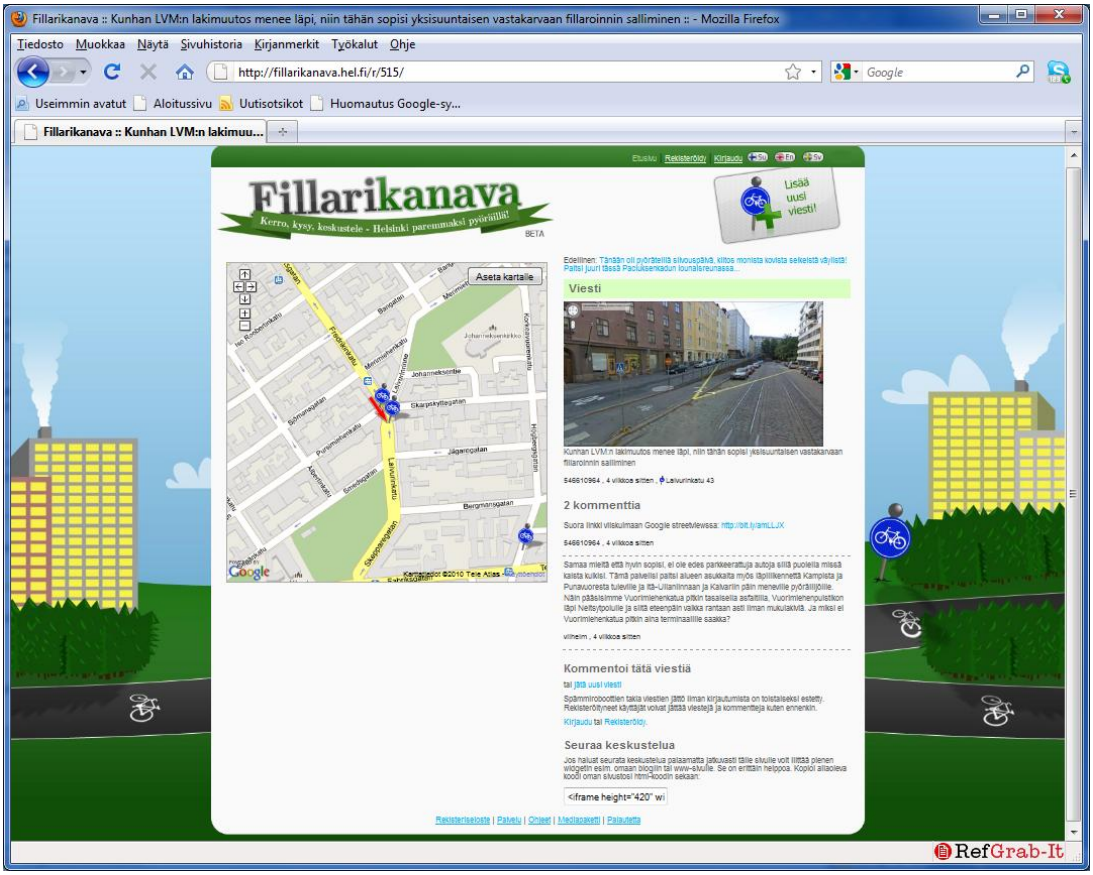

Figure 17: An example case in Fillarikanava, with a descriptive photo attached

5.1.2 Technology

Fillarikanava is an example of modern Internet service based on Web 2.0 technologies and paradigm. It is uses XHTML/AJAX/JavaScript on the client-side and Python on the server-side technologies. Fillarikanava tries to provide easy *accessibility for customers.* All business logic of the service is located on the server-side, while the rich user interface (maps, with interactive icons "floating" on top of them) puts some practical technical requirements– for example the service does not work very well with Internet Explorer 6.0 (which is still used widely). Also Fillarikanava currently (in practice) needs a PC to function; there is no separate mobile interface, although it would be quite logical in the context of biking.

Security is not a major issue as there are little confidential data in the service. No strategically important data are displayed or used in the service and the service is not operated in the City of Helsinki network – allowing less consideration for network security, especially in the pilot phase. In Fillarikanava, security considerations are most relevant in the context of usernames and passwords, which were added as mandatory, to protect the service from spam bots.

Original goal of Fillarikanava was to keep the barrier for participation as low as possible- However, due to spam bots, registration is now required. Requiring registration/login has lowered the usage numbers, and thus a CAPTCHA validation should be considered to lower the participation barrier again (Rantanen 2009). However, reusing digital identities in other services (in this case, Facebook Connect[12]) is an example of lowering this barrier.

[12] http://developers.facebook.com/connect.php

Fillarikanava cannot be personalized to users' own needs. However, "mashlets", i.e. personalized views to the service, can be embedded to other web pages, like blogs, allowing a sense of personalization. *User profiles* are not public – personal profile pages (including for example photos and statistics regarding participation) have been shown to be important in the success of social media services – thus improved use of user profiles (and profile pages) should be considered as a way to create a sense of community, to allow for mechanisms for merit – and thus to increase the motivation of users.

As mentioned in Chapter 3, open APIs are one very fundamental value-creating technological feature in Web 2.0 applications. Open data should also enable easy integration portability to other systems, internally like ERPs and to other Internet services. Currently *content reusability* is not sufficient – for example, other systems have not been able to use the data and normal issue tracking processes in the City organization have been bypassed using screen prints from Fillarikanava (Rantanen 2009).

5.1.3 Organization

From an end-user perspective, the City of Helsinki is seen as the service provider. Customers are the units and end-users. HILA Open Oy can be considered platform provider as well as the application provider.

The service is in a pilot phase and perhaps due that, various technology providers do not have such a strong role in the value network. Core network operators are not relevant for end-users. For the customer (organizations within the City of Helsinki), the network operator (e.g., their IT/network environment regulator) may be relevant in terms of, e.g., policies and requirements regarding IT systems integration and such. Web hosting is different for the pilot phase of the project as for the real service. There may be issues related to the common platform, all applications may have common technical infrastructure requirements for hosting.

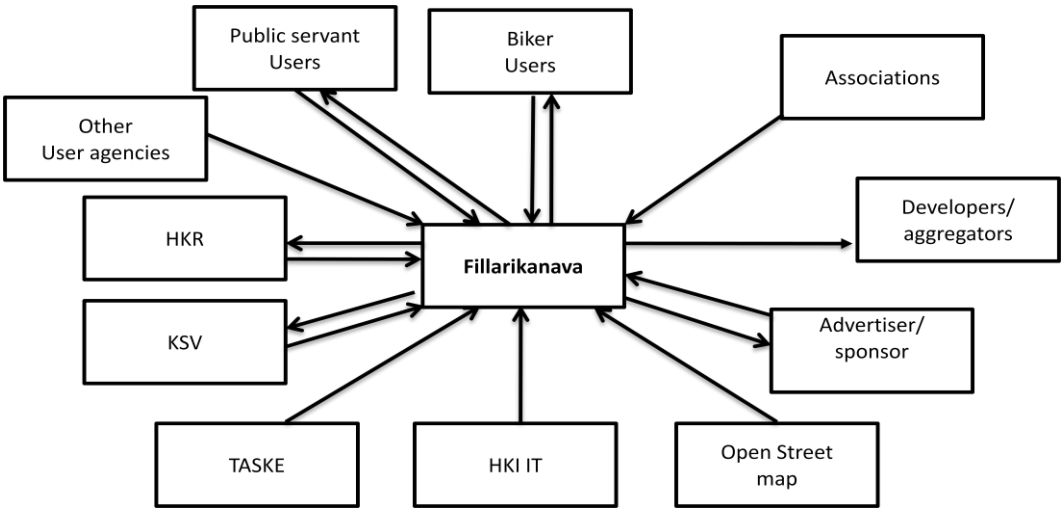

Figure 18: Value network for Fillarikanava

The *structural partners* of the value network are the City of Helsinki, its organizations related to the service (TASKE, HKR, and KSV) and the end-users. The key resource is the capability for executing end-to-end dialogue between the city workers and the city bikers and turning the dialogue into action.

In theory, as the application and platform provider HILA has no formal authority and could in fact (and in theory) be replaced by another developer. In practice, however, much of the service vision is contributed by HILA, thus redeeming a "structural" classification. However, HILA needs to be aware of its position as a potentially replaceable entity as one risk to its business.

Supporting actors include web/application hosting party, map provider OpenStreetMap, alternative authentication provider Facebook, biking-related organizations and other city projects and initiatives. City of Helsinki IT department might be considered a contributing or supporting actor, depending on its role in, e.g., integration and security issues. The city internal communication department is also one important contributing actor.

Fillarikanava is a mashup of data and thus the value network of data production must be thought of a little bit differently than presented in the STOF method. Essentially Fillarikanava contains three kinds of data:

(1) user-generated "issues", with placeholders for these issues marked on a

(2) digital map of Helsinki from OpenStreetMap[13]

(3) comments (from users and City workers) on these issues

Fillarikanava, although in a pilot phase, already has a rather large value network, with stakeholders in citizens, businesses, employees, IS/IT organizations, SIGs. Considering transition to a continuous service, there are no obvious missing parties from the value network. Currently, as TASKE is acting as the owner of the service and is a mediator within the City Helsinki, it actually reduces network complexity, not everyone has to directly collaborate with everyone else.

Partners within the value network must be open and willing to collaborate, and head towards a new paradigm for serving the citizens. It is likely that problems will be encountered so trust is needed. Enough effort should be put on the various skills and attitudes of the involved parties in this type of *transformational or business process reengineering* project. Communication is needed to ensure that the strategy and resources of each organization are aligned. Using open engagement and Web 2.0 technologies in e-government causes changes in the job roles of public servants (Government 2.0 Taskforce 2009). This is an issue that has been discussed by the City organizations as well. So far, there has not been a sufficient amount of *social interactions* between the various stakeholders in the service (see also Figure 19: Discussion with users frustrated about the lack of feedback from civil servants and Fillarikanava service provider).

[13] http://www.openstreetmap.org

The service is originally purchased by the City of Helsinki as a pilot project from HILA (including training, consultation and support for pilot period). For the initial pilot, investments needed from the City are quite minor and no new technical resources are needed; the main investment is in the time invested to try out a new way of operating

Possible benefits of Fillarikanava include transformational thinking, cross-organization cooperation, financial savings, better maintenance, better planning, better citizen engagement through dialogue, better satisfaction in the city organization.

5.1.4 Finance

The service does not create direct revenue per se to the City of Helsinki. There are no transactional, subscription or license costs. End-users are not a source of revenue as they are the ones creating the content (and a majority of the value).

Advertising or sponsoring revenues are common in web-based services. Advertising is perhaps the most common business model of social media in commercial applications. Using advertising and sponsorship model might mean that the City itself is not the service provider but rather just an external party using the service, changing the value network configuration. However, it is seen as one possible option. (Rantanen 2009)

The City itself is not gaining any royalties, license or commission revenues, or kick-back or float-revenues based on usage. HILA could get revenues from the City in a number of ways, which include

- Project-based work (not necessarily a good and scalable way for this)
- Licenses for organizations which use the results (difficult to control),
- Licenses for administrator accounts (may lead to lower usage)
- Volume of customer feedback (the issues of ‘paying for low quality’, and being difficult to estimate.)

Benefits in the form of savings and increased productivity are likely to come in the long run. In the short term, must avoid overly optimism: there is a learning curve, simultaneous use of several systems and lack of best practices or guidelines. (Rantanen 2009)

There may be a split of costs between different parties; costs need to be split in a reasonable way between the user organizations. Most important costs for Fillarikanava include: development, training costs, communication and marketing, operative costs and support and maintenance costs.

All these costs are currently quite reasonable and are in essence covered by TASKE or other city central organizations. Fixed costs are minimal: there are no permanent costs in labor, facilities or even hardware. In later phases, City organizations need to agree on a split of costs, which may be dependent on, for example, the organization's usage of Fillarikanava or the volume of feedback to that particular organization.

For the City of Helsinki organization, the key risk source is the issue of whether Fillarikanava can actually save money, improve the quality of work in the organizations and help align with their strategies – not form "just another communication channel" that consumes effort without clear benefits. Already from the usage statistics it can be seen that the service is likely to be adopted by a sufficiently large amount of users to research whether the service can deliver its intended value.

The service concept can be copied; there are no patents or such IPR. However, it is impossible for another party to develop the same service to compete at a given time. Thus this put the City of Helsinki in a good position from a customer point of view – it can replace HILA as the Fillarikanava vendor and replace it with a similar construct.

In an online community or social media service, ownership of the content may become an important issue, at a practical and strategic level. If HILA owns the content (and community within, i.e. the user data), it may become a lock-in factor, and the cost and effort of changing the vendor would become more and more difficult for the City. In addition to that, there is currently little competitive advantage for HILA. Professional services on top of the actual product can be valuable and build trust between HILA and the City.

5.1.5 Summary of Critical Success Factors

5.1.5.1 Customer Value

Compelling value proposition. The value proposition offered in the service seems quite solid and attractive. Competitiveness is not an issue for end users, there can effectively be one of these at a time.

Clearly defined target group. The core target group (customer organizations of the city and bikers) is very clear. In addition, secondary user groups (those somehow affected by or interested in biking) and next customers (other cities, other city organizations) can also be identified. However, more should be known about the user group to develop the service – for example, needs, capabilities, context, available resources and motivations are unknown.

Incentives for participation. In Fillarikanava, there are limited incentives for participation. There are no customer loyalty mechanisms – there could be e.g. reminders, marketing, etc. from the service provider. Users are investing their own time to use the service for the benefit of the service provider. Probably best incentives are that the service is developed so there is a sense of virtual community (e.g., user profiles), capability to participate and responsiveness to issues by the City officials.

Although the quality of service delivery has technically been improved dramatically, there is still plenty of room for improvement in the process quality. An example of unsatisfied users is shown in Figure 19.

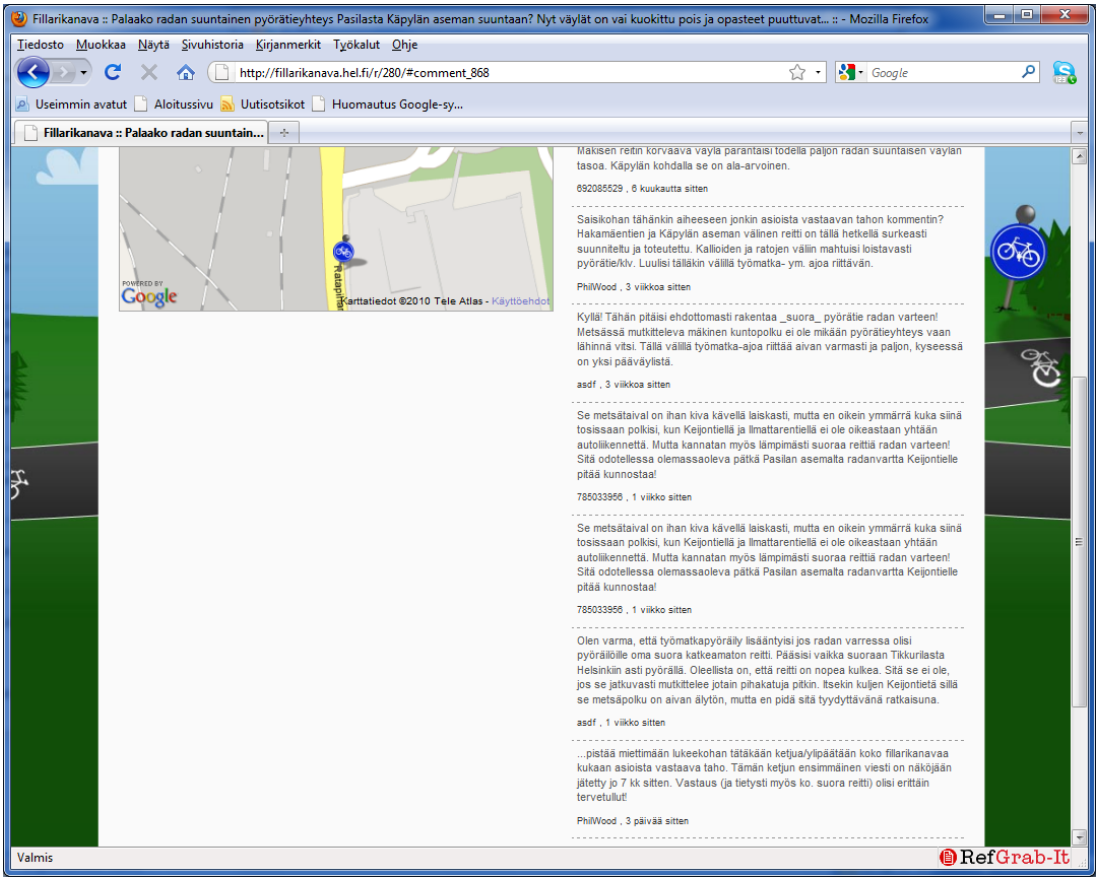

Figure 19: Discussion with users frustrated about the lack of feedback from civil servants and Fillarikanava service provider

5.1.5.2 Network Value

Satisfactory benefits. Fillarikanava offers no direct revenue to the City. Sources of indirect revenue through savings, better service, citizen engagement and satisfaction are all quite difficult to measure and are typically quite after-the-fact. This is currently the most difficult issue.

Satisfaction with the division of the investments, costs, benefits and revenues. The capacity for handling investments and costs by organizations is currently unknown. City organizations do not need to make other investments than time. Benefits (esp. monetary) might not be seen for some time, and this is a clear risk.

Acceptable risks. Financial risks in Fillarikanava currently are quite reasonable. Huge investments have not been made, and those that have been made are mostly related to work effort. It is not foreseen that investments will be needed before the service has proven its viability. There are not many indirect financial risks in the sense that there are, e.g., no loss of revenue, or loss of money in technology failures, security breaches or such. Technological risks are currently moderately low in that there are not many investments on the technology side, and neither is it foreseeable in the future that this will be a key issue. Nonetheless, there are some technology issues and thus delivered value can be said to be under target.

Sustainable network strategy. It is unknown whether strategic interests of all parties have been discussed sufficiently. However, it is seems that they are aligned, on a high level. For HILA, it would be beneficial if this system was more critical to the functioning of the biking infrastructure in the City of Helsinki – it should pursue a more strategic partnership with the customer organizations. On the other hand, HILA needs to productize the Fillarikanava engagement model into a repeatable format.

Acceptable division of roles. Based on the network analysis, it does look like currently all necessary roles have been satisfactorily fulfilled. The actors have roles that are a little bit new to them. For example, city organizations are used to interacting with citizens, but in this new way of working the needed roles and processes are not yet clear. Helsinki City TASKE organization and the feedback spearhead project ("kärkihanke") is the key focal actor, serving as a coordinating actor within the various city organizations. It is unknown whether this organization has enough formal or informal power within the City organizations to govern collaboration, especially in the long term.

External value creation mechanisms are currently limited, although there are plans for improving data reuse. Data should be available through open APIs and also there are plans for embeddable "mashlets" to reuse the content in other services like blogs.

5.2 KommentoiTätä

The basic idea of KommentoiTätä[14] service is to offer a simple, intuitive and efficient tool for involving people in social commenting and deliberative discussion about documents, for example during their drafting process. The KommentoiTätä concept is loosely based on CommentOnThis[15] service.

Social commenting here means that comments by a particular user are visible to all other users (and placed at the corresponding places in the documents) this means that the commenting becomes a constructive process, users can build on others comments, the same comments are not submitted several times as may happen in "blind" commenting.

KommentoiTätä is an initiative of the SOMUS project and is not yet an official live service. Currently there is no planned business setup for providing the service to the market outside initial pilots, although some discussions regarding a possible commercial deployment are ongoing.

A particular use case is to use KommentoiTätä as a tool for e-consultation (by means of deliberative discussion) and constructively building understanding. The Ministry of Justice piloted KommentoiTätä in conjunction a with its "Periaatepäätös demokratian edistämisestä Suomessa" document consultation process. It was used as an unofficial alternative tool in getting in comments to the document from various stakeholders. In addition, KommentoiTätä has been tried in different uses cases: as a tool for eliciting requirements for a service and in a workshop to gather stakeholder comments on a draft document in real-.time during a workshop, with the idea of constructively building a vision towards the next draft of the document. The goal is that the writing and commenting process becomes smoother and faster, with better commentary by stakeholders and less need for secretarial editing type of work.

Although KommentoiTätä is not limited to usage in an e-government context, this analysis is scoped to that environment.

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[14] A pilot version of KommentoiTätä is currently running at http://flexi.tml.hut.fi/kt
[15] http://www.commentonthis.com

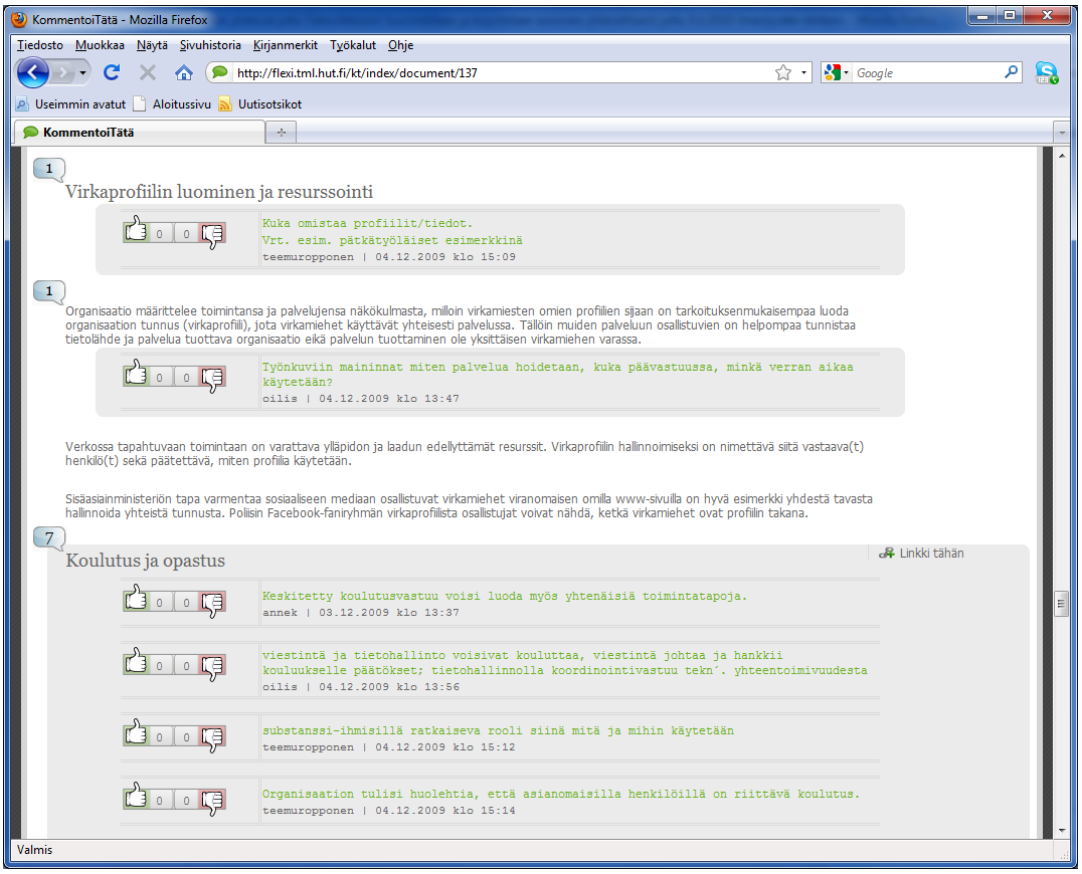

Figure 20: Screen capture of KommentoiTätä, a document with comments added

5.2.1 Service

KommentoiTätä is a new kind of tool for executing a centrally maintained open process, "social commenting", constructive information building, and capability for deliberation. Its *value proposition* can be stated as:

> *"An easy-to-use and effective web-based service (tool) for engaging document owners and their stakeholders in an open, social, constructive and deliberative commenting and discussion process"*

KommentoiTätä does not have a limited or particular customer segment built into the design yet. However, development on the concept prototype has been made with the assumption that customers are government agencies, businesses or other organizations that want to engage outside stakeholders into their knowledge creation and document creation processes by providing these stakeholders with the possibility to contribute to document creation by commenting openly.

Thus key end-users include people from, e.g., agencies (civil servants) who want to elicit input from other users and the users (stakeholders of the document owner, e.g., citizens, civil servants of other agencies, NGO's) who are contributing, i.e., reading or commenting the document drafts.

Context and intended value. The service fits into the trends and goals of engaging stakeholders more into processes – both in businesses and in public administration. People use KommentoiTätä as an alternative to current ways of document commenting. Current processes (in government) include email commenting, (hand) written comments, discussion forums and offline editing with text editors, have been found to be sometimes problematic, slow and error-prone. An intended common use case is that document owners send invitations to stakeholders to comment on document drafts. The benefits to *document owners* include

- efficiency of gathering comments (through ease of use, not stuck in e-mail masses, not multiple versions of documents around, all comments documented and timestamped, etc.)
- a single access point to comments
- capability to reach unknown people
- less overlapping feedback

Benefits to the *collaborators* (people commenting) include:

- ease of use
- status/reputation gain (through others seeing comments)
- potential sense of community, belonging in the process, empowerment
- improved understanding of complex issues through visibility to the comments, empathy for the views of others

Expected value is likely to be dependent on the service provider as well as the organization asking for comments. This means that while a service prototype residing on a university server, for example, may not warrant much expectations from potential users, a request to comment a document by a ministry may in itself build expectations for the service.

The *perceived value* unique to each user depends on previous experience or existing alternatives to using the KommentoiTätä service.

- existing social media or internet-based commenting services (including, but not limited to Scribd, MixedInk, EtherPad and GoogleDocs)
- existing governmental commenting services, like Otakantaa.fi discussion forum
- current offline and online commenting processes (those who take part in the democratic process, by means of more traditional ways, email or paper commenting)

However, problems with these competitors include:

- Systems are proprietary
- Terms of usage (e.g., Facebook, Google) are unclear or unsuitable for governmental use
- Possible discontinuation, for example, the company behind EtherPad bought by Google (AppJet 2009)

A key user group, stakeholders outside document owner organizations, thus commenting must be free for participants. They are already investing their time and energy for common good. Organizations (such as government agencies and NGOs)

Some quite good and popular similar products exist for free (e.g., based on the freemium model). Thus it will probably be very difficult to attain similar volumes like the competitors. It is then likely that a potential commercial service needs to adopt a *segmentation strategy (*instead of *differentiation* or *cost leadership strategies)* and provide high value to this particular market by catering to its needs more closely. Such needs may include, for example, helpdesk and support services, training (in e.g. usage, internal process change management, deployment) services, or easy integration interfaces to other systems.

Like using most Internet services, the *effort* to start using KommentoiTätä is very small. To start using the service (either as a "discussion starter" or commenter), one must just register. Then a user is immediately able to upload a document for commenting, or comments. While mandatory registration may discourage some users (unlike in EtherPad, in which where no registration is required), registration is typical in many web services.

Currently preparation of documents can be done in several ways: documents can be imported (Word 2007 docx format only), they need to be brought by cutting and pasting from text editors, or documents can be written and edited by a lightweight editor embedded in the service. Better support of document import formats is needed for wider adoption.

Although there are distinct users (and thus some profiles), these are not used for the benefit of the service. There are no features promoting the *sense of community*. So far, use has been very limited, so the *acceptable user community* CDI target has not been reached. There are not user activation mechanisms, like notifications when others have commented on a document.

5.2.2 Technology

KommentoiTätä is a web-based tool for multi-person content interaction, but limited to documents containing text and images. It is web browser-based and in practice can be used only from personal computers. The system is open and is operated on a web server. KommentoiTätä does not contain any personalization and currently its community features are very limited.

There is typically a tradeoff between *security* and usability. In KommentoiTätä, users must register to the service to be able to comment on the documents. Usernames are as such not verified, so individuals may have multiple user names. Usernames are password-protected, but not with a heavy security. By default, document authors (or uploaders) can modify the documents, registered users can comment and anyone can view the documents. Security mechanisms are likely to become more import later in the development process.

Quality of service refers to, for example, speed, accuracy and availability of the service. At a pilot phase it is not very easy to determine what the quality of the service is. It is likely that in this type of a service issues related to availability (e.g., uptime, backups) are much higher in importance than for example fast response. Issues like data integrity are very important, as individual data items (comments) are valuable and cannot be lost (compared to e.g. streaming media, where some data loss may be acceptable).

KommentoiTätä supports some technical mechanisms for *content reusability* in other applications, using a REST API. This has not been tested in practice, as usage rates have been too low to evaluate the usefulness of the API.

KommentoiTätä has a good, but not excellent *accessibility for customers*. Currently it is available for use by common Internet browsers (Internet Explorer, Mozilla Firefox) and has been tested in several versions of these. Unfortunately quite old, unsupported (and incidentally, unsecure) versions of browsers (Internet Explorer version 6) are still in use even in government agencies (Salminen 2009). An Internet connection is obviously needed by customers. There are no transactions requiring billing. Speech, email or mobile interfaces are currently not supported and currently there are no use cases for location data.

Management of user profiles deals with collecting user data, such as preferences, interests, behavior or other user-specific data – either automatically or from the user. User profiles are used to add value to the service (e.g., personalization or community features) and to gain customer insight. User data is not currently used for providing added value to the user or the service. User data management is a combination of an external OtaSizzle COS software component and user database and a user database specific to KommentoiTätä.

5.2.3 Organization

Currently any organization or user can use KommentoiTätä, either as a document owner or as a commenter. No formal agreements exist, and thus the *network* is *open*. Participants wanting to comment or seek for comments must register, but this registration has very little legal obligations or limitations. Currently users and stakeholder cannot engage with each other through *online interactions*, meaning that users only interact with the document. This causes poor sense of community and limited building of social capital.

Network governance There is typically a dominant actor, often the one with access to the customers and end-users or the one that developed the service offering, which was managing the value network (Bouwman et al. 2008a). A governmental central IT organization may strongly recommend or promote the use of a service like KommentoiTätä, but most likely it cannot force organizations to use the particular tool. It is likely that at central IT organization will be the buyer of the tool, and act as the advocate of various governmental organizations. Interestingly, at the same time as there is a push towards new forms of engagement with citizens, there are also initiatives to work in a more agile way and with smaller IT companies, meaning that while there may not be an obvious fit in assumed collaboration culture, there may be a will to transform the culture.

There are a few possible *partners* related to proving the service offering. KommentoiTätä is likely to be developed and provided by parties outside the government (may be separate entities). There is however, likely to be a coordinating party within the central government (e.g. State Chancellery/VIM; KuntaIT, ValtIT) who provides some of the services to the governmental organizations. Separate partners may be used to fulfill the service offering in terms of e.g. consulting, training and process reengineering.

Network complexity If a central governmental party acts as a mediator to some of the other government agencies, the network complexity will be reduced. Although the use cases for commenting may have a large number of users, the network structure in itself is not very complicated in terms of control. Value creation is itself much more complicated, as much of the value to the user organization comes from the network of other users. The user organization may not, however, have any formal ways to bring out this value, but rather must assume trust, goodwill, negotiation and cooperation as drivers of value.

A possible value network for KommentoiTätä is laid out in Figure 21.

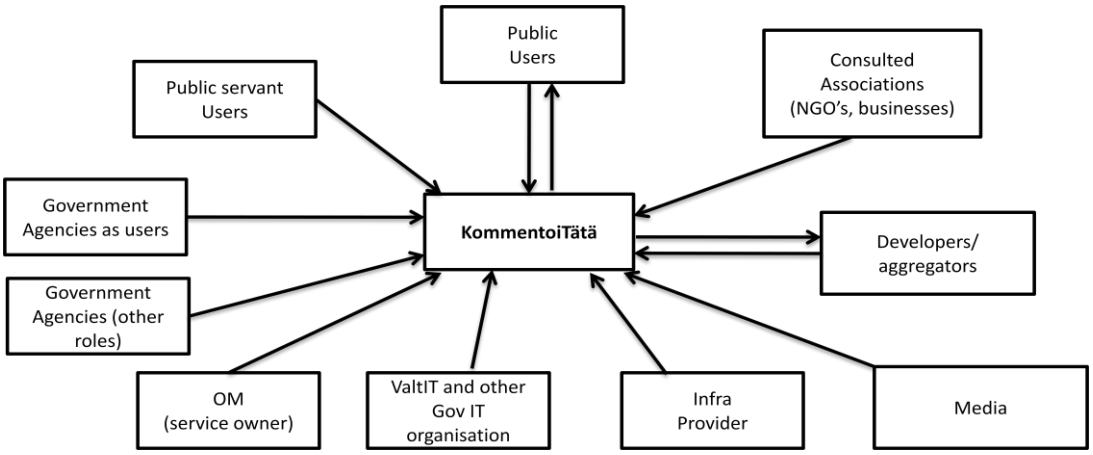

Figure 21: Value network for KommentoiTätä

The key question remains that what are the prerequisites that KommentoiTätä can really be used as a value-creating tool for the e-consultation process and what does that mean for the organizations executing and participating in particular consulting activities.

5.2.4 Finance

Division of investments. The key issue is: who could and would finance the development, operations and maintenance and support of the service. Currently the service is in a testing phase and maintained by the research group, but TKK or any academic institution is not the logical provider of this service.

KommentoiTätä could be a part of the national e-participation environment (*osallistumisympäristö*) that is being built by the Finnish government under the SADe program (Finnish Ministry of Finance 2009). This could mean that it is centrally maintained by the governmental IT infrastructure. It could also be under one ministry, perhaps the Department of Justice.

Another alternative is that KommentoiTätä is not a service run by any governmental agency but rather that it is a normal public service that just happens to be used by the governmental agencies. This would also fit in line with the goal of utilizing existing services and audiences instead of only creating new ones (Finnish Ministry of Finance 2009). While this is an economic choice, it would leave a lot less choice and control to the agencies.

Pricing is a difficult issue in KommentoiTätä. There are competing tools available, with somewhat similar functions (MixedInk, Scribd, EtherPad, and GoogleDocs). The pricing needs to be based on the fact that the service differentiates itself from these competing services, for example by means of integrating to processes, other systems, or other critical features. If the service is free, an alternative way to gain revenue needs to be defined. A freemium model could be incorporated –features to be included in "exclusive packages" included could be for example analytics, data backup, export/import features, personalization and such features that add value but are not in the core of the value proposition for all users. However, freemium model is also used by some of the potential competitors, thus it may be more beneficial to utilize a different approach.

Valuation of contributions and benefits. Monetary investments are likely to be the issue of the service provider, service developer and a possible central government agency. There are no other structural partners in the value network. It is likely that an approach of continuous (small) development based on end-user input seems a logical way to proceed. Other partners are not structural (databases, web application server) and can be replaced easily.

Division of costs and revenues. The infrastructure needed for deploying the service technically is quite modest. Open-source web server, application server, backup systems and database can be used. Resources can be bought from an infrastructure provider or the infra can be installed by e.g. ValtIT. Major costs derive from human labor, in product development, marketing, product management, training and operations.

The cost of marketing can be assumed as quite modest (compared to B2C-services) as there is a limited number of customer organizations to work with. Coordination activities related to network governance, for example gathering requirements for development or deployment of the system use into working processes of user organizations are key costs.

According to studies, business actors tend to reduce network complexity by using intermediaries, which act as single points of access (Bouwman, Vos & Haaker 2008). This is a possibility in the case of KommentoiTätä as well.

5.2.5 Summary of Critical Success Factors

5.2.5.1 Customer Value

Currently, the *value proposition* offered in the service is not clear enough. Is this a constructive knowledge building tool for all or just for collaborative e-government purposes? There are some similar tools (in the more generic use case) and the competitive edge is unclear. Integration to the back-end (consultation process), or in some cases, just the fact that it is running on a non-commercial server, could be competitive advantages and differentiating factors.

Clearly defined target group. The target group is not quite clear. It is not clear whether the service is targeting government agencies or all people having documents requiring collaborative editing. Not much is known about the customers in terms of developing the service, for example the processes of the participants in document drafting and online consultation in the agencies. Further study is suggested regarding real requirements.

Currently there are limited *incentives for participation*, for ad hoc collaboration. As a replacement for commenting by other mechanisms, like e-mail, other incentives may not be necessary. However, more benefits could potentially be gained by building a participatory community. Notifications of comments and information regarding the persons commenting the document are examples of features that would likely increase service usage.

5.2.5.2 Network Value

Satisfactory benefits. There are no direct revenue sources. Sources of indirect revenue through savings, better service, citizen engagement and satisfaction are all quite difficult to measure and are typically quite after-the-fact. Also in this case, this is the key issue. The service is in such an early phase that there is not a proper value network in place. It would be beneficial if this system was more critical – it should pursue a more strategic partnership with the customer organizations.

Acceptable risks. Technological risks are currently low in that there are not many investments on the technology side, and neither is it foreseeable in the future that this will be a key issue. Nonetheless, the technology is not currently delivering its value proposition; delivered value is clearly under target.

Sustainable network strategy. As the service is in an early phase, with a value network still forming, much cannot be said about sustainable network strategy. Likewise, *external value creation,* for example, through content reuse in other services, has not been tested and evaluated.

Acceptable division of roles. The value network is not yet in place. Thus all business roles are also not in place and all needed roles are not even known. On the other hand, the service is still in a development phase and without a clear value proposition. The open engagement model is pushed in policy programs, but it is unknown if the actors are satisfied with the changes and how fast they can adapt. Currently there is a stated focal actor missing. The Democracy Unit of the Ministry of Justice and some governmental IT organization are probably the best alternatives for the role of the focal actor.

Chapter 6

Conclusions

6.1 Designing Collaborative E-government Services

In this Thesis, two different e-government service concepts have been studied and analyzed, using the STOF method. For the domain for e-government, STOF has been modified, with modifications based on literature study in this domain.

E-government services have business models too, although often they do not aim at creating revenue in the same way as commercial services. Benefits, such as financial value gained by the e-government services are often very difficult to measure, as the goals are often high-level targets, such as equal access, participation, improved decisions and acceptability of decisions.

The two cases that are studied are new kind of emerging e-government services. These cases the principle of engaging citizens into the processes in an open and transparent way, enabled by the use of Web 2.0 technologies and driven by people contributing their knowledge and insight without monetary compensation, sometimes referred to as participatory economics. These kinds of applications could be called *collaborative e-government services*.

6.2 Research Cases

6.2.1 Fillarikanava

Of the two studied cases, Fillarikanava is clearly further in its development lifecycle. It is currently being piloted by the City of Helsinki.

Already based on current knowledge and usage figures, it seems like there is a demand on the citizen side – bikers are contributing information to the service willingly. There is a reasonable amount of discussion and user interactions in the Fillarikanava service and many of the contributions are useful. Users seem motivated to participate.

There are several improvements that should be made. Bikers are on the move, but there is no support for this context – a *mobile version* to suit the context of biking better, could be very beneficial. Right now the user submissions are mainly textual descriptions of issues. A mobile version of the service might also increase the number of images uploaded to the site, if it is easy enough. A *better data reuse* needs to be enabled so the issues can be exported to other systems. This can mean open APIs for data, different visualization techniques for the data, as well as various linking and embedding mechanisms for the content.

Although bikers are a group of people that can easily feel a sense of community within themselves, there are very few *community features* currently in the Fillarikanava service. For example, it is well-known that users are motivated by status gain they get from participating in online communities, yet there are no profile pages or other ways to promote the users. Also worth considering are ways to make the service more fun and rewarding. Probably a user study needed to understand the context, motivations and current service experience of the biker users better.

The City of Helsinki has stated that collaborative electronic feedback services are among its strategic spearhead projects. Timing for the project has been right, and with an internal buy-in, there may be capacity to experiment with different approaches. It is also understood that the change in citizen engagement is not just about tools, but also about redefining job roles and processes.

However, it remains to be seen whether this service is strategic enough for the participating organizations to open and transform their processes. Are the participating organizations motivated enough to use Fillarikanava in their daily work - does this help the public servants of the agency perform their work better? The City must show to the biker community that their contributions are meaningful and have an effect on their daily lives – this is done at a practical level by being present and active users in the service and even more concretely, in the actions of the organizations. This – two-way interaction and engagement and showing that people can influence the organization's processes – are perhaps the most difficult part of this initiative and still remaining to be realized.

HILA Open Oy, the developer of the service, needs to consider its strategic. What next? How can the Fillarikanava service be replicated or extended? Is the logical way to expand to other cities with the same niche use case? Another approach could be be to expand within the current customer, to similar use cases -. for example in transport and traffic, or sports and recreation domains. HILA must also consider its service offering. Since Fillarikanava is about changing the way the City operates, and it being about more than just technology, there may be room for consulting, both in internal and external engagement processes.

6.2.2 KommentoiTätä

KommentoiTätä is in an early phase of development. The value proposition needs considerable clarification – how does the tool position itself compared to similar services on the market, and thus what are the target groups and use cases? The suggested approach is to target the service for a niche user group, but with a high value-add. Whereas the tools currently existing in the market target the use cases collaborative *writing* or document *editing*, KommentoiTätä should focus on *collaborative constructive consultation* and *deliberative discussion*.

With the development in such an early phase, the value network is also still not ready. The value creation mechanism needs to be defined in detail. The current use case of commenting documents is limited, but there are value elements that can be specific and beneficial in this case. For example, it can be assumed (but needs to be verified) that constructive commenting in one place can improve both the quality of output as well as the efficiency of the process.

KommentoiTätä needs trialing in different kinds of use cases, to find the right use cases to approach and to get real feedback from the users. With current pilots, not much can be said. It would be interesting to consider KommentoiTätä as a part of the participatory environment being built under the SADe program.

6.2.3 Similarities

Fillarikanava and KommentoiTätä, despite having quite different use cases do have a number of similarities. Most importantly both services need to define the amount of lock-in to particular processes (creating higher value in a few use cases) vs. reusability (higher number of use cases). Likewise, both services need to consider how to motivate users to recurrent usage and activities that may not have instant personal gain. For example, currently there is very little sense of community present and service developers need to consider adding features to improve on this. However, it is important to note that creation of what feels like a community is not an absolute value.

6.3 STOF in Collaborative E-government

The STOF framework used in the study is a holistic model for designing and analyzing services and their business models. It was originally developed from a mobile services perspective but can and has been used in a range of applications including e-government services, by researchers and practitioners. Unlike some other frameworks found in literature review, STOF provides not only a means to analyze services and their business models, but also very practical tools for design and decision-making. STOF is also useful in analyzing digital services over their lifecycle, from innovation to existing in the market. STOF model was found to be a good tool for diverse analysis of the Fillarikanava and KommentoiTätä services and also useful in structuring discussion with the stakeholders.

The background of STOF in mobile and commercial services is inherent in its design and some modifications and interpretations need to be made to be suitable for the type of services researched in this Thesis. In applying STOF, some changes need to be made to stressing importance of CDIs, CSFs or particular items in an analysis.

Even after interpreting STOF in the context of collaborative e-government, there were items that STOF was found to be missing or not sufficiently explicit about.

Particular areas that needed refinement include:

- Online communities, user-created content and community creation, including personal profiles, motivations of users and rewarding mechanisms
- Value creation through non-monetary mechanisms, like social capital, openness and trust
- Encouragement of open innovation and external value creation through content reuse and open APIs

6.4 Limitations of Study

While the spectrum of potential number of social media based e-government services is practically infinite, a limited number of such services have been developed and in use so far in Finland. Within this Thesis, only two services were studied and both of these services still lack many features to be called collaborative e-government or Government 2.0 services that combine user-created content, Web 2.0 technologies and government agencies. These services are also both in the early phases of development and limited empirical data about these projects currently exists.

While the cases do highlight some of the issues found in the literature study, further research is needed to make generalizations on these matters.

6.5 Future Research

Both social media and the field of e-government are developing rapidly. There are a number of things that need further study, in various academic fields.

Among future research items brought up by the work of this Thesis include:

- *Motivations*: why do people participate in e-government social media? How can this participation be encouraged and accelerated – by technical (e.g. usability) and non-technical (marketing, communication between government agencies and citizens) means?

- *Privacy*, *profiles* and *user management* in e-government services, particularly concerning the civil servants. How do the civil servants feel about participating in social media? How do they feel about identities – personal vs-professional? How does the identity (or lack of) affect the behavior in the community?

- How do are user *communities* formed in e-government services – are there characteristics that are different from commercial services? When and how can a sense of community be built into e-government applications?

Especially concerning *Fillarikanava*:

- Does the service really *transform* the way the City executes its biking-related work? How does Fillarikanava affect the daily work routines of public servants in the particular organizations?
- How can Fillarikanava in practice be *integrated* into the City's *information systems*?
- How can the content created in the service be used in other applications to create value?
- How easily can the Fillarikanava concept be *replicated*?
    - How can Fillarikanava be generalized for *other use cases* than biking?
    - How similar are the value networks and other issues in *other municipalities*?

Especially concerning *KommentoiTätä*:

- Does the service really *improve* the *quality* of the consultation process considerably? Is the consultation quality better through a service that allows social construction of opinions and deliberative discussion in an open way?
- Does KommentoiTätä solve process throughput bottlenecks? Is there an improvement in *efficiency* or *decrease in costs* to implement citizen consultation in this way?
- On a very practical level, usability and technical requirements for large-scale usage need to be studied. The prototype needs to be developed to suit one or more use case much better to determine value brought by the service.

Finally, regarding the *STOF model and method*, the modifications to STOF suggested in this Thesis need further scrutiny. While they can be justified, there may be some other modifications that are just as applicable. More case studies may be needed to identify a well-balanced STOF for collaborative e-government.

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