

## **Development of public e-services - a method outline**

Göran Goldkuhl & Annie Röstlinger  
Research group VITS  
Department of Management and Engineering  
Linköping University

### **1 Introduction**

There has been a rapid growth in the development and launching of new public e-services over the web to citizens. This is dependent on general development of applications on the web, national and international programs for e-government development and also on demands and expectations from external clients as citizens and companies. It seems that there has been a focus on broad launching of public e-services rather than emphasis on quality in use for the e-services. To get good points in national and international bench-marks, it is more important to have a great number of e-services than having a few really good ones. This means that there exist several e-services with a low degree of usage. Many e-services can also be criticized for usability deficiencies.

Putting information on the web as home pages is usually not seen as a case of information systems development (ISD). Traditional methods for ISD are probably seldom used for creating informative web pages and building web pages with some functionality (as an e-service) may follow this established way of non-method use. However, is it really so that we do not need any ISD methods for developing public e-services? Are public e-services (PeS) such simple IT applications, that there is no need for methods as a support for their development?

We have been studying several public e-services during the past years and also conducting evaluations and participating in the design of such applications. Our experiences are that many e-services are very complex and definitely need a systematic and well-thought way of development. There are many aspects and issues to take into consideration. The public administration context is important and is needed to take into special account. We claim that there is a need for methods for PeS development. Would it be possible to use standard ISD methods, as e.g. RUP (Kruchten, 2002) for PeS development? One reason for the non-method use when developing web applications seems to be that many existing methods are conceived as too large and complex to use for development of such small and specific applications as public e-services. Standard ISD methods are thus probably not the road forward. However, it might be possible to use parts of such methods through a situational method adaptation (Karlsson, 2005).

The *purpose* of this paper is to present an outline of a method for development of public e-services. It will not comprise a detailed description of the method and it should thus not be seen as “method manual”. The paper describes a principle structure of the method (“a method framework”). The method is structured according to different aspects (themes) to consider when developing a public e-service.

The development of the method has been based on several sources, namely:

- Studies and assessments of public e-services (including requirements specifications)
- Participating in design projects concerning public e-services
- Reading of extant literature on public e-services and their development

These different sources will be described in section 3 below. An account of the research process will appear in section 2. The outline of the new method can be found in section 4. The paper is ended with conclusions in section 5.

## **2 Research approach**

The purpose of this research is to produce actable knowledge for people planning, assessing and participating in the development of public e-services. The character of the research and the aimed knowledge is thus explicitly pragmatic. A method has an explicit prescriptive character. The research process can be understood in terms of *practical inquiry* (Goldkuhl, 2008b). This means a combination of 1) participating in practical evaluation/design projects producing knowledge of value to these “local practices” and 2) creating practical knowledge that is valuable to greater audiences (as a kind of “general practice contribution”). Local practice contributions (1) are thus seen as instrumental in relation to the greater purpose of creating a method (2) that goes beyond single interventions. Local practice interventions are thus preparatory and exploratory steps in the development of this method. We learn from conducting studies, assessments and design endeavours and these learnings are continually compared, structured, abstracted and re-framed into a method outline.

We mention especially the following studies that we have participated in concerning public e-services and egov systems:

1. An assessment of a requirements specification for an e-service for application of child care (Goldkuhl, 2007)
2. Participating in the design of an e-service and an internal IT application concerning planning and accounting of personal assistance to disabled persons (Goldkuhl, 2008a; 2009a; Sjöström & Goldkuhl, 2009)
3. Participating in the design of e-services for application of food permit (Röstlinger & Cronholm, 2009)
4. Participating in the design of e-services for application of building permit for plates
5. An evaluation of an e-service for tax declarations (Goldkuhl, 2009b)
6. Participating in the design of information exchange between state agencies and municipalities concerning social welfare allowances

Selected relevant experiences from these different cases are described in section 3 below. The numbers above will be used to refer to the different cases. The use of these different cases means that our practical inquiry research also comprises elements of action research (e.g. Susman & Evered, 1978), design research (e.g. Hevner et al, 2004) and evaluation research (e.g. van der Knaap, 2004). It is beyond the scope of this paper to make any deeper discussions concerning these research approaches and how they become parts of practical inquiry.

Development of this method has been performed in a *multi-grounded* fashion (Goldkuhl, 2004). Three grounding modes have been applied:

- Empirical grounding
- Theoretical grounding
- Internal grounding

The method development has been informed by empirical studies mentioned above. It has also been informed by studying literature (theory) on public e-services. Theoretical grounding involves also relating to own theoretical development on public e-services (e.g. Goldkuhl & Persson, 2006; Goldkuhl, 2007). Internal grounding means to create a method with coherence and internal congruence. The method is used in grounding itself. The development of the method has been informed by these sources and continually assessed and revised according to empirical and theoretical insights. Parts of the method have been applied in the cases. However, it is important to state that the method not yet been applied and assessed in toto.

The method development does not start from scratch. We have used some method thinking and method components from more “traditional” ISD (e.g. Goldkuhl & Röstlinger, 2005).

### 3 Public e-services: conceptualisations and experiences

What do we mean by a public e-service? What is the target area for a proposed method? Public e-services and egov services have been discussed widely in the literature for several years. There is a distinctive differentiation in several models between informative and transactional websites/services (e.g. Layne & Lee, 2001; SAFAD, 2000). Informative websites have a one-way communication from public agency to citizen (figure 1). Many e-services offer the possibility of a *two-way communication* between the parties (e.g. Ancarani, 2005). In all our cases (#1 - #6), it has been both natural and necessary to adopt this two-way communication view on e-services (cf. e.g. Goldkuhl, 2007; Röstlinger & Cronholm, 2009). This means also that public administrators within public agencies are seen as users of e-services (figure 2).

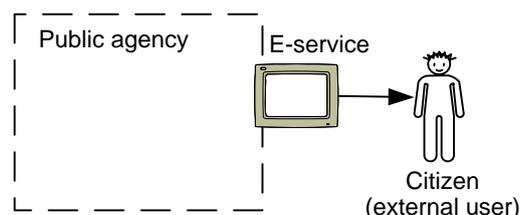


Figure 1 Public e-service with one-way communication from public agency to citizen

This view implies that information is generated and directed to (and in favour of) the two parties. This does however not seem to be in line with the standard service conception emanating from service management/marketing theory (e.g. Grönroos, 1990). In this theory there is a view on service as coming from provider to customer/client which might be misleading. Although there is a modulation in service theory through the concept of co-production of services (Ramirez, 1999), this does not change the fundamental direction of something going from provider to client.

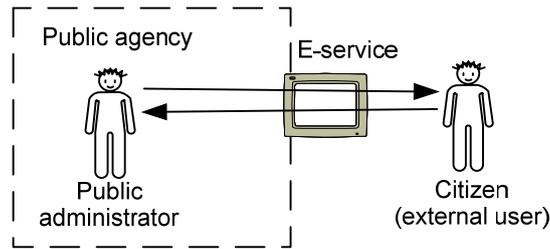


Figure 2 Public e-service with two-way communication between public agency and citizen

The public agency is of course responsible for setting up the e-service as a software application aimed for use by citizens. In this respect there is such a direction of the e-service (from provider to client). However concerning the information content of the e-service, there is a two-way direction of it: The agency communicates to the citizen and the citizen communicates to the agency. This makes e-services as special kinds of services: *Co-services*. In case #5, this notion of co-service was developed (Goldkuhl, 2009b). It is very important that both parties obtain something valuable from the use of the e-service and its instantiated communication (ibid; Röstlinger & Cronholm, 2009).

There are several authors who claim the importance of *work process re-design* when developing egov systems and e-services; e.g. Andersen (2002), Anzböck & Dustdar (2004), Becker et al (2006), Chourabi et al (2009), Tambouris et al (2004). A design focus on public e-services as an interaction channel to citizens should not exclude re-organizing internal processes: “For e-Gov initiatives to succeed, in addition to modernising the front office by offering public services via Internet portals, attention should be also paid to streamlining, re-organising and supporting the back-office processes of public administrations that provide services to citizens” (Tambouris et al, 2004 p 122).

A process perspective has been adopted in all our cases mentioned above (#1 - #6). This means both 1) a *client-centric view* and 2) acknowledging how the e-service interaction is interlinked with internal agency activities (the *workflow*). This follows two well-known and important aspects of process management; a customer/client orientation and an emphasis on the flow of activities (e.g. Davenport, 1993). Sometimes a process orientation only implies a focus on the process flow. This was apparent in our analysis of a proposed e-service for child care (case #1; Goldkuhl, 2007). In this case it was obvious that the driving force was the internal efficiency and not information service to the citizen (ibid). Similar experience was gained in case #5 (Goldkuhl, 2009b). A process perspective may thus be restrictive if it is not including a citizen-centric view. Actually, there are different processes which may be focused. It is possible to have process view ending with citizen and his use of the e-service. However, a broader process view is also possible to adopt: The process of the citizen. The e-service process is then only instrumental in relation to the citizen process. What will the citizen do after being served by the public agency? This *double process view* has evolved in cases #3 and #4 (Röstlinger & Cronholm, 2009).

Predominant in process management is the workflow view on processes (e.g. Davenport, 1993). Another alternative is however also possible: a coordination or *interaction view* (Keen & Knapp, 1996). In such a view the focus is on the different actions the parties conduct directed to each other and thereby continually influencing the social relations between them (e.g. Winograd & Flores, 1986). Besides a workflow orientation, an interaction view has been adopted in the case studies. Actually, one important contribution has been the adaptation of a

(commercially flavoured) business interaction model to public administration – citizen interaction models (Goldkuhl & Röstlinger, 2007; Goldkuhl, 2008a).

E-service applications are rarely stand-alone IT applications. They may be related to other internal IT-systems (legacy systems) or even integrated parts of such systems. This is often labelled *back-office integration* (e.g. Bekkers, 2006). In all of our case studies mentioned above *architectural issues* of this kind has been an important design theme. In complex integrated e-services (e.g. Layne & Lee, 2001; Sarikas & Weerakkody, 2007) there may be a need for an *inter-organisational integration* of egov systems in different public agencies. In such cases there is great challenge of arriving at a proper egov *interoperability* (Cava & Guijarro, 2003; Scholl & Klischewski, 2007). Interoperability has been divided into several layers. The European Interoperability Framework (EC, 2004) defines three layers: *Organisational, semantic and technical interoperability*. Besides these three, there is a need to add a judicial (or legal) layer of interoperability (Bekkers, 2005). Legal aspects are problematic in relation to information exchange between public agencies, which has especially been found in case #2 (Goldkuhl, 2009a). However, there does not need to be complex inter-organisational relations in order to have *judicial challenges* in e-service development. Complexities in regulations may produce challenges in the design of public e-service; e.g. in case #3 (Röstlinger & Cronholm, 2009).

E-services are to be used by external users; i.e. the clients (citizens, companies) of the public agency. The agency has little control over these external users and there is rarely ever any room for education. This implies great challenges for ease-of-use of such e-services. *Usability issues* seem to be extremely important in the design of public e-services (e.g. Barnes & Vidgen, 2007; Bonacin et al, 2009; Buckley, 2003; Halaris et al; 2007; Tan & Benbasat, 2009). In several of our case studies, usability issues have played an important role. The evaluation in case #1 involved problems of usability (Goldkuhl, 2007). The design cases #2 - #4 have had a great focus on usability issues (Sjöström & Goldkuhl, 2009; Röstlinger & Cronholm, 2009). The development of the two e-services in case #3 and #4 has involved the articulation of specific design criteria for public e-services (Röstlinger & Cronholm, 2009).

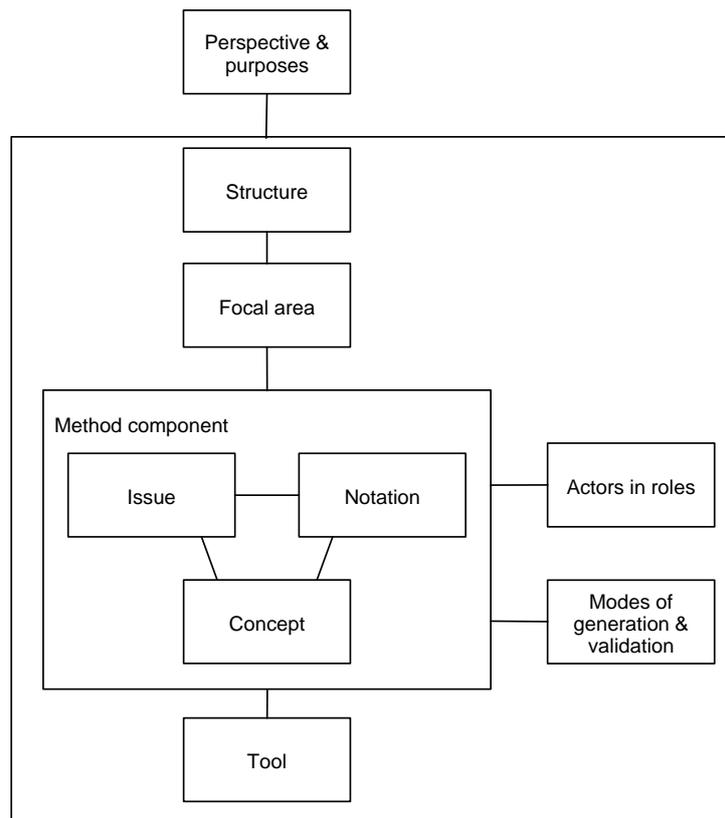
## **4 A method outline**

### ***4.1 What is a method?***

In this paper we do not present a full method for PeS-development. What we present is an outline of a method; i.e. parts of a method. We will in this section clarify what kind of method constituents we use in this method outline.

In figure 3 we depict principal constituents of an ISD method; i.e. a conceptual meta-model. A method is based on certain *perspectives* on development work and its intended outcomes. This entails different development *purposes*. Usually, a method is structured into different areas. The method can for example prescribe a sequence of development processes (phases). The method can also describe hierarchy of areas; i.e. one area that consists of sub-areas. Some methods do not comprise sequences of areas into phases. Instead different areas are described as tools in a tool-box; areas are clustered together. An area in a method describes usually some aspect to consider; i.e. something to focus in this area. We call it therefore a *focal area*. This means that methods consist of focal areas which are ordered into different *structures* (sequences, hierarchies, clusters).

Each focal area can consist of one or several *method components* (Röstlinger & Goldkuhl, 1994; Goldkuhl et al, 1997; Karlsson, 2005). A method component consists of three integrated parts: *Issue*, *notation* and *concepts*. The issue states what to consider and what to perform (a procedural aspect). Notation contains the rules for model creation and interpretation (description rules). Concepts express what type of phenomena to consider (conceptual aspects). Concepts are usually included in both issue and notation and they are thus what hold the procedural and descriptive parts together (what “things” to talk about). Method components describe thus *what to perform* and *how to describe*; or in other words what kind of questions to pose (issue) and how to document the answers (notation).



*Figure 3 The method notion*

Besides method components, it is important to say something about what *categories of actors* that may participate in the development process and accompanying *roles* and *cooperation forms*. Who poses a question and who answers? It is also important in what ways questions are posed and in what ways answers are delivered (*modes of generation and validation*). Methods can be embedded in software *tools* or other carriers.

We have in figure 3 and the text above given a brief description of a comprehensive method notion. In this paper we will not present a full method description. The main part of our method description is different focal areas (aspects to consider) and their structure. The aspects are described in section 4.2 and depicted in figure 5. The structure of the method is described in section 4.4 and figure 6. We have also said something about the contents of the focal areas, i.e. different method components. We do not give a detailed description of method components. A brief procedural and conceptual description is given; not anything

about models and notations are mentioned. We have not either discussed anything about cooperation forms and modes of generation and validation in accordance with the purpose of just presenting a method outline. Arguments concerning the method and different parts of it have been presented above (mainly in section 3) and below. This means that we have described parts of perspective and purposes.

#### 4.2 Five aspects to consider: Public e-services in context

Public e-services realize communication between citizens and public agencies. Citizens get informed about rules and regulations, about rights and obligations and several other societal issues. Citizens can also communicate to agencies in different predefined ways; e.g. issuing applications for permits. The communication between citizens and public administrators are often not only mediated through e-services but also through internal IT-systems. Integrated e-service may also imply information exchange with IT-systems in other agencies or sometimes some other type of external organisation. Public e-service in context is depicted in figure 4.

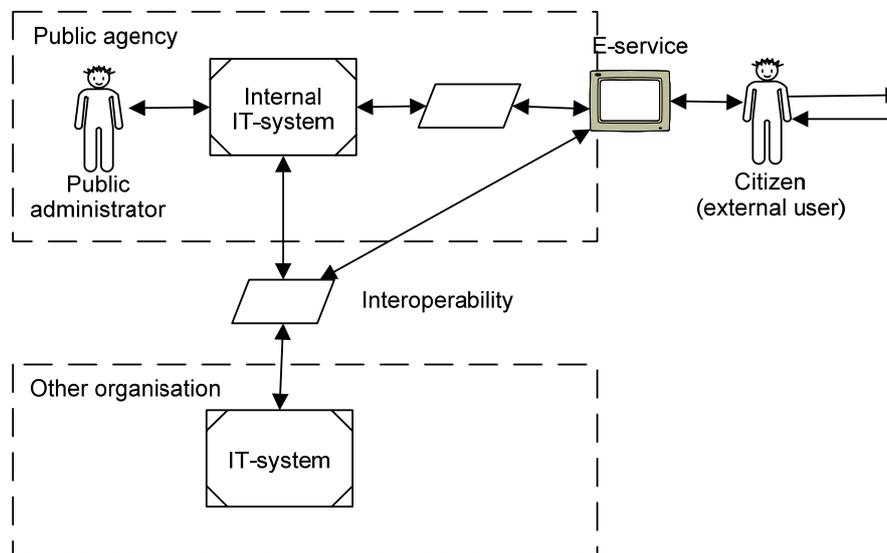


Figure 4 Public e-service in context

When developing public e-services, we need to consider this context. There should be a focus on the e-service, but several other related issues need also to be taken into account. We follow the literature and experience review in section 3 above. One important issue is that e-services are parts of work processes. A process orientation should therefore be a feature of the e-service method. The e-service is also part of an IT-architecture. It is necessary to clarify issues of information exchange between the e-service and other related IT-systems. The public administration context of e-services implies different regulations and other types of norms. To know and relate to the regulations is important for achieving good processes and e-services. A normative investigation should be included in e-service development. As said above, e-service is communication (government-client communication). This e-communication is related to other kinds of communication; both human-to-human and other IT-mediated communication. Communication within a restricted domain will use linguistic elements (concepts and terminology) particularly associated with this domain (workpractice). E-services are developed to support communication between several parties and it is important that both parties understand each other. A conceptual-linguistic inquiry should also be included in e-

service development. This gives us five important aspects to consider during public e-service development:

- Government-client communication
- Work process
- Norms (regulation & workpractice goals)
- Workpractice language
- IS-architecture & message exchange

These five aspects are illustrated in figure 5.

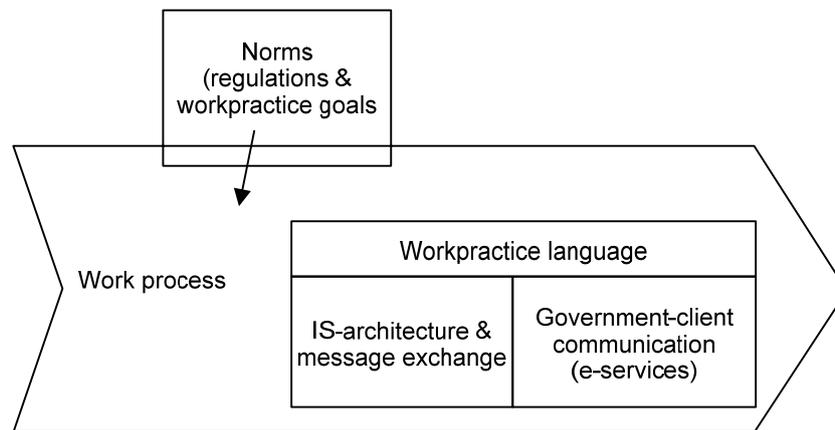


Figure 5 Five aspects to consider

#### 4.3 Method structure

E-services are used to communicate, e.g. when a municipality communicates with citizens. Developing e-services thus implies a change in the communication between the parties. This change of communication may mean that a previously non-electronic way of communicating is supplemented or replaced by an e-service. But it can also mean development of a previous simple e-service to a more functional e-service.

When developing e-services we must start the developing process by studying preconditions for the future e-service. This means that we should inquire the current situation. When the current state is clarified it is possible to begin the design of future solutions. We emphasise that this should be done as a co-design of business processes and IT-systems. Future e-services should be designed contextually and integrated with the surrounding activities. To only replace a paper form with a digital one is not often an appropriate solution for an e-service. Appropriate measures can include both adapted e-services and other types of changes.

In both the diagnosis phase (current state) and the design phase (future state) it is important to deal with all the five aspects mentioned above.

The method should be conceived as a *tool box*. The different components (the cells in figure 6) should be utilized when relevant. The method components should be utilized in a flexible, iterative and alternating fashion. We do not describe any strict “water fall” procedure of the method, since there does not exist any such task ordering.

We describe the contents of this method outline in some more detail below. We focus each aspect and within each aspect we describe 1) diagnosis of current state and 2) design of future state.

	<b>Diagnosis of preconditions (current state)</b>	<b>Co-design of processes &amp; IT (future state)</b>
<b>Work processes</b>	Analysis of current processes	Process re-design
<b>Regulations &amp; workpractice goals (norms)</b>	Identification & analysis of norms: Analysis of regulations Analysis of goals	Norm prioritization Proposals of norm changes Norm validation of design proposals
<b>Government-client communication</b>	Analysis of forms & current web sites and e-services	E-service design (usability & functionality)
<b>Workpractice language</b>	Analysis of applied concepts (conceptual modelling)	Conceptual re-design
<b>IS-architecture &amp; message exchange</b>	Analysis of current IS-architecture	Re-design of IS-architecture Design of message exchange

Figure 6 Method overview: Five aspects and two states

**4.4 Work processes**

*Analysis of current processes*

As mentioned several times above, government – citizen communication is part of broader work processes. This process context should be investigated and described through some kind of process modelling. In section 3 above, we described two types of process orientations: a workflow view and an interaction/coordination view. Analysis of current processes could mean either one or both of these two process modelling approaches. We also argued above (section 3) that process description should not be restricted to internal processes of the public agency. To understand the needs of the client the e-service has to meet we should also inquire the process of the client.

The investigation of current processes should be problem and goal driven. Various problems and goals of the activity should be identified and clarified to govern the scope, depth and focus of the process analysis. Workpractice goals are here seen as parts of what is described as norms, which are described below (in section 4.5).

*Process re-design*

Instead of just making a simple digitalization of a paper form, an e-service development should imply a process redesign. The transfer to electronic communication should exploit potential of the IT medium. This should include making the work processes more efficient. The diagnosis of the current work processes should have revealed different problems. With inspiration from these problem and process descriptions, more efficient work processes could be designed.

#### ***4.5 Norms: Regulations & workpractice goals***

##### *Identification & analysis of norms*

Norm analysis comprises studies of laws, other regulations and workpractice goals which are relevant for the future e-service. This means what is considered normative in the workpractice. The study of regulations includes statutes on different levels (laws, ministry regulations, authority regulations) and also policy documents and authority guidelines; cf e.g. Goldkuhl (2009a). The analysis of statutes should of course involve domain-specific statutes, but also statutes and policy documents of general/cross-sectional character (ibid). Besides regulations, it is important to clarify different workpractice goals which may be relevant for the actual govern – citizen communication.

##### *Norm prioritization*

The design of e-services and work processes should of course be based on existing legislation and other regulations. However, this can hardly be a simple and "straightforward" design process where solution properties are derived from clear and non-conflicting norms. Different norms express different values and there is a need to examine and balance such different norms/values in an explicit valuation process. Different regulations might be in conflict with each other and this implies a need for prioritization and synthesizing of norms/values (ibid). In this process it is important to explicate the core societal values and differentiate these from "incidental" arrangements expressed in regulations on lower levels.

##### *Proposals of norm changes*

Norm analysis may lead to the identification of norms that are unnecessarily restrictive for the e-service to be designed. It is not uncommon that especially authority regulations are very detailed and thus restrictive for the workpractice. Unfortunately, many regulations are not written in a technology neutral way. This may involve severe constraints on how e-services can be designed.

It is usually far beyond the responsibility of an e-service development group to change governmental norms. There are other actors who are responsible for the issuing of norms. Such a development group can however formulate proposals for norm change, together with the reasons for these changes and submit these proposals to issuing bodies or other responsible actors.

If one avoids to voice criticism of existing norms, one can not expect these to be changed. A development group working with new e-services should have a deep workpractice knowledge which should include a potential to identify unnecessary norm restrictions and propose adequate norm changes.

##### *Norm validation of design proposals*

When a design of new e-services is proposed, there is a need to check this design proposal in relation to identified norms. Public e-services should be a way to implement regulations practically in public administrations. A critical review of submitted proposals should be made comparing with various regulations and workpractice goals. This norm validation can of course give rise to changes in design.

## **4.6 Government-client communication**

### *Analysis of forms & current web sites and e-services*

Many public e-services are based some already existing government – client communication through paper forms. It is important to critically review the existing paper form before the design of a new e-service. It is pivotal to clarify the kind of communication that is pursued through the form and also to identify different problems in the existing communication. We should not transfer pitfalls in existing forms to the electronic communication. A critical examination of existing forms should create a proper knowledge base for the design of future e-services.

A new e-service might be located within a public agency's website. For the e-service design it is important to be knowledgeable about standards and principles for this website. If there are any restrictive principles, which are not favourable for the upcoming e-service, these should be identified and questioned.

To obtain inspiration for the e-service design, it is also possible to study existing e-services for this domain if there are any. Such an exploration should comprise both positive properties, possible to imitate, and inappropriate properties, important to avoid.

### *E-service design*

E-service design is both a structured and creative task. It is important to utilize the established knowledge base on existing communication, work process, regulation and IT-systems in the design process. It is also important to think in new ways to really exploit the potentials of IT as a communication and action medium in order to create value for the clients and other stakeholders. We suggest the e-service design to be a prototyping process based on explicit quality ideals (Röstlinger & Cronholm, 2009). The e-service design comprises both issues of functionality and usability.

A public e-service should be a two-way communication between a public agency and external clients. It needs thus to be designed as two-way communication instrument. This implies many design issues (ibid) as e.g.:

- How to communicate the overall purpose of the e-service and what tasks the client-user may perform (exposure of action potential)
- How to structure the e-service into different pages and what sequences there should be between these pages
- What regulatory knowledge should be furnished to the client-user and how to structure this knowledge into different layers
- How to structure the client's process of submitting information
- How to organize the feedback to the client-user
- How the e-service should be adapted to and integrated into the work processes of the public agency and the client
- How to differentiate between and structure informative and performative e-services
- How to communicate information from the client-users to the internal users (public administrators)
- How the internal users should up-date the public e-service with new information

#### ***4.7 Workpractice language***

##### *Analysis of applied concepts*

In the government – client communication different workpractice concepts are used. In order to create an e-service of high communication quality it is pivotal to make a conceptual analysis. What concepts are used in the communication and in the workpractice? Identified concepts need to be described and structured preferably through some kind of conceptual modelling.

##### *Conceptual re-design*

The design of the e-service should be based on the analysis and modelling of existing concepts. However, there might be a need for conceptual development. New concepts need to be introduced. Existing concepts may need to be clarified, refined or altered. Revised conceptual models should be created if needed.

#### ***4.8 IS-architecture & message exchange***

##### *Analysis of current IS-architecture*

An e-service application is seldom a stand-alone system. It will be part of existing website. It will communicate with other IT-systems, probably case handling legacy systems. The current IS-architecture is important to clarify as a basis for the e-service design. Different standards and other technical principles should also be explicated as important infrastructural elements.

##### *Re-design of IS-architecture & design of message exchange*

The new e-service application should be furnished into the existing IS-architecture in a controlled way. The e-service's message exchange with other IT-systems should be specified. This message exchange should be fully consistent with the conceptual analysis conducted. Message transfer principles should be chosen and adaptation needs to be done to such transfer protocols. The design of message exchange is to ensure semantic and technical interoperability.

### **5 Conclusions**

To develop appropriate public e-services is a challenging task. It is important to have understandable and usable user interfaces for the citizens as external users. The regulative character of public administration needs to be taken into account. The new e-service should be well integrated into the existing IT infrastructure. The potential of IT as an enabler of process redesign should also be considered. Even if the e-service is a rather restricted web application, there are several contextual matters to deal with. We claim that there is a call for methods for e-service development.

We have in this paper presented an outline of a method for public e-service development. We have presented five focal areas to be used 1) in diagnosis of current workpractice and 2) during design of the e-service and the future workpractice. There are more to be added to the description of the method; e.g. different notations. Future research will contribute with more contents of the method.

Parts of this method have been used in some of the case studies mentioned above. Future research will contribute with more testing of the method. The method is expected to be further developed through such method applications. The method will be more fully described in future papers.

## Acknowledgements

This research has been performed with financial support from the Swedish Governmental Agency for Innovation Systems (VINNOVA). The result (the proposed method) emanates from several research projects. We want to express our gratitude to fellow researchers in these different projects: Stefan Cronholm, Owen Eriksson, Anders Persson and Jonas Sjöström.

## References

- Ancarani A (2005) Towards quality e-service in the public sector: The evolution of web sites in the local public service sector, *Managing Service Quality*, Vol 15 (1), p 6-23
- Andersen K V (2002) Public sector process rebuilding using information systems, in: Traunmüller R, Lenk K (Eds. 2002) *EGOV 2002*, LNCS 2456, p 37–44, Springer-Verlag Berlin
- Anzböck R, Dustdar S (2004) Modeling Medical e-services, *Proceedings 2nd International BPM Conference*, LNCS, Springer, Berlin
- Barnes S, Vidgen R (2003) Interactive E-Government: Evaluating the Web Site of the UK Inland Revenue, *Journal of Electronic Commerce in Organizations*, Vol 2 (1)
- Becker J, Algermissen L, Niehaves B (2006) A procedure model for process oriented e-government projects, *Business Process Management Journal*, Vol 12 (1), p 61-75
- Bekkers V (2005) The Governance of Back Office Integration in E-Government: Some Dutch Experiences, in Wimmer MA et al (Eds, 2005) *EGOV 2005*, Springer LNCS 3591, p 12–25
- Bonacin R, Melo A, Simoni C, Baranauskas C (2009) Accessibility and interoperability in e-government systems: outlining an inclusive development process, *Universal Access in the Information Society*, Vol 8
- Buckley J (2003) E-service quality and the public sector, *Managing Service Quality*, Vol 13 (6), p 453-462
- Cava I, Guijarro L (2003) Interoperability Issues of Shared Infrastructures for E-Government, in Traunmüller R (Ed, 2003) *EGOV 2003*, Springer LNCS 2739, pp. 369–372, Berlin
- Chourabi H, Mellouli S, Bouslama F (2009) Modeling e-government business processes: New approaches to transparent and efficient performance, *Information Polity*, Vol 14, p 91–109
- Davenport T H (1993) *Process innovation. Reengineering work through information technology*, Harvard Business School Press, Boston
- EC (2004) *European Interoperability Framework for Pan-European eGovernment Services*, The European Commission
- Goldkuhl G (2004) Design theories in information systems – a need for multi-grounding, *Journal of Information Technology Theory and Application (JITTA)*, Vol 6 (2) p 59-72
- Goldkuhl G (2007) What does it mean to serve the citizen in e-services? - Towards a practical theory founded in socio-instrumental pragmatism, *International Journal of Public Information Systems*, Vol 2007 (3), pp 135-159

- Goldkuhl G (2008a) The evolution of a generic regulation model for e-government development, in *Proceedings of the 5<sup>th</sup> Scandinavian Workshop on E-Government (SWEG-2008)*, Copenhagen Business School
- Goldkuhl G (2008b) Practical inquiry as action research and beyond, in *Proceedings of the 16th European Conference on Information Systems*, Galway
- Goldkuhl G (2009a) Innovation in a regulated environment? - Legal barriers for e-government development, *International Journal of Public Information Systems*, Vol 2009 (2), p 77-95
- Goldkuhl G (2009b) Socio-instrumental service modelling: An inquiry on e-services for tax declarations, in Persson A, Stirna J (Eds. 2009) *PoEM 2009*, LNBIP 39, pp. 207–221, Springer, Berlin
- Goldkuhl G, Lind M, Seigerroth U (1997) Method integration as a learning process, accepted to "The 5<sup>th</sup> Annual Conference on Methodologies Training and education of methodology practitioners and researchers", The British Computer Society, Preston
- Goldkuhl G, Persson A (2006) From e-ladder to e-diamond – re-conceptualising models for public e-services, in *Proceedings of the 14<sup>th</sup> European Conference on Information Systems (ECIS2006)*, Göteborg
- Goldkuhl G, Röstlinger A (2005) Change Analysis – Innovation and Evolution, invited paper to the 14<sup>th</sup> Intl Conf on Information Systems Development, Karlstad University
- Goldkuhl G, Röstlinger A (2007) Clarifying Government – Citizen Interaction: From Business Action to Generic Exchange, in *Proceedings of the 4th Scandinavian Workshop on eGovernment*, Örebro
- Grönroos C (1990) *Service marketing and management. Managing the moments of truths in service marketing*, Lexington Books, Lexington
- Halaris C, Magoutas B, Papadomichelaki X, Mentzas G (2007) Classification and synthesis of quality approaches in e-government services, *Internet Research*, Vol 17 (4), p 378-401
- Hevner A R, March S T, Park J, Ram S (2004) Design science in information systems research, *MIS Quarterly*, Vol 28 (1), pp 75-15
- Karlsson F (2005) *Method Configuration - method and computerized tool support*, PhD Diss, Department of Computer & Information Science, Linköping University
- Keen P G W, Knapp E M (1996) *Every manager's guide to business processes – a glossary of key terms & concepts for today's business leaders*, Harvard Business School Press, Boston
- Kruchten P (2002) *The Rational Unified Process*, Addison-Wesley, Boston
- Layne K, Lee J (2001) Developing Fully Functional E-government: A four-stage model, *Government Information Quarterly*, Vol 18 (2), p 122-136
- Ramirez R (1999) Value co-production: intellectual origins and implications for practice and research, *Strategic Management Journal*, Vol 20, pp 49–65
- Röstlinger A, Cronholm S (2009) Design Criteria for Public e-Services, in *Proceedings of the 17th European Conference on Information Systems (ECIS2009)*, Verona
- Röstlinger A, Goldkuhl G (1994) Generisk flexibilitet - På väg mot en komponentbaserad methodsyn, Research group VITS, Linköpings University [in Swedish]
- SAFAD (2000) The 24/7 Agency. Criteria for 24/7 Agencies in the Networked Public Administration, Swedish Agency for Administrative Development, Stockholm
- Sarikas O D, Weerakkody V (2007) Realising integrated e-government services: a UK local government perspective, *Transforming Government: People, Process and Policy*, Vol 1 (2), p 153-173
- Scholl H J, Klischewski R (2007) E-Government Integration and Interoperability: Framing the Research Agenda, *Intl Journal of Public Administration*, Vol 30, p 889–920

- Sjöström J, Goldkuhl G (2009) Socio-instrumental pragmatism in action, in Whitworth B, De Moor A (Eds, 2009) *Handbook of Research on Socio-Technical Design and Social Networking Systems*, IGI, Hershey
- Susman G I, Evered R D (1978) An assessment of the scientific merits of action research, *Administrative Science Quarterly*, Vol 23 (4) p 582-603
- Tambouris E, Gorilas S, Kavadias G, Apostolou D, Abecker A, Stojanovic L, Mentzas G (2004) Ontology-Enabled E-gov Service Configuration: An Overview of the OntoGov Project, in Wimmer M A (Ed. 2004) *KMGov 2004*, LNAI 3035, p 122–127, Springer, Berlin
- Tan C W, Benbasat I (2009) IT Mediated Customer Services in E-Government: A Citizen's Perspective, *Communications of the AIS*, Vol 24, Art 12
- Van der Knaap P (2004) Theory-based Evaluation and Learning: Possibilities and Challenges, *Evaluation*, Vol 10 (1), pp 16–34
- Winograd T, Flores F (1986) *Understanding computers and cognition: A new foundation for design*, Ablex, Norwood