THE E-CO MODEL – CITIZENS' DRIVING E-SERVICE QUALITY

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ABSTRACT

Many models for characterizing and evaluating e-services emphasise different levels of complexity and maturity of e-services. These frameworks takes as their starting point an organisational point of view on e-services where it seems that integration between different public authorities is the ultimate goal. An unresolved quest is however to judge and design e-services desired by the citizen. For this scope it is essential to identify recipients of the e-service and for what purpose these recipients ought to use the e-service. One group of recipients of public e-services is the citizens. In this paper shortcomings of existing frameworks are identified founded in a citizen-centric value base. These shortcomings are then used as a driver for putting forward an alternative model for evaluation and design of e-services.

Keywords: Public e-services, Public Citizens, Stage models, e-Co model, Co-design

INTRODUCTION

The amount of e-services provided by the public sector for citizen is continuously increasing. Public e-services can be conceived as "electronic services which can be accessed, for example, via the Internet, TV or mobile devices, and which are offered to citizens, companies, professional organisations, interest groups and other official bodies by organisations in the public sector" (VINNOVA, 2006, p. 11). This definition indicates a broad spectrum of technologies in use but also several target groups for the e-services. Some benefits mentioned with the introduction of e-services are a quicker handling of cases; support for democratic processes; effective work processes; and systems that simplifies contacts with public authorities (ibid). The provision of e-services from the public sector is often coined as "e-government" and can be seen as the process where public administration transforms its internal and external relationships with the use of modern information and communication technology (UN, 2003). There are today several reports that e-government rather is driven by a need to increase efficiency and decrease costs than driven by the needs of the e-citizen (c.f. e.g. Flak et al, 2005). Rationalisation as a tool for saving public money still dominates the key incentive in e.g. the Swedish e-government discourse (Ilshammar et al, 2005). Public e-services need to provide value that is based on what citizens want: "...e-government is justified if it enhances the capacity of public administration to increase the supply of public value, i.e. the things that people want" (UN, 2003, p. 1). Layne and Lee (2001) report that there are still many challenges that governments need to consider if they want to evolve into efficient and effective e-governments in support of citizens' demands. They (ibid) especially mention three challenges: universal access; privacy and confidentiality; and a citizen focus. The citizen focus means that government processes need to be organized for citizens' convenience instead of the convenience of the government (ibid).

The research reported upon in this paper is driven from the research question; *how to evaluate and design citizen-centric public e-services*. The purpose of this paper is to put forward an alternative model to existing frameworks

Research around how to characterize e-services has been on the agenda for quite some time now and we can identify a number of models which applied gives different insights. We will describe some of these models and their characteristics. As a common characteristic these models are citizen or customer centric in the sense that the degree of

self-service often is the most important dimension. Still the starting point is however the organization and the view is "how can they, the citizens, use our service". In this sense the view is organization-centric. In this paper we want to take the stance in the citizens' perspective; "in what way can I as a citizen use their e-services". This perspective can be developed into a model describing the services related to citizens needs. We will develop such a model, apply it to a set of existing e-services and finally discuss how such a model can be used as a driver for characterizing, designing and evaluating e-services giving more value from a citizen perspective.

Models build upon an underlying perspective and this perspective can be described as an ideal (Ackoff, 1981). If we for example have a simple model describing the degrees of self-service as a maturity model for e-services, self-service is the ideal. Such a model can than be used in two moods. The first is as an evaluation instrument giving insights. We can evaluate an e-service with the model and see in what degree it performs as self-service. In another mood the model can be used as a design driver. In the task of designing an e-service the model serves as a vision for design, and the vision is self-service.

In this paper we will use the citizens' perspective; "what can they do for me as a citizen." This perspective can be formed into a model. Such a model we suggest can have four elements, here formulated as questions. 1: What kind of new situation do I want to be in after using the service (The vision)? 2: What is my situation today (The current situation)? 3: Which services can take me from today towards my vision? (The means) 4. How much closer to my vision did I really get by using the service? (Feed back)

An important part of the paper is to describe this model more in detail and show how it can be used as a driver for e-service quality, both in the evaluation mood as well as in the design support mood.

Following this introduction we will introduce two frameworks used for characterizing e-services. Then in section 3 we evaluate these existing frameworks. These pros and cons will form the basis for generating an alternative model for characterizing e-services. This alternative model – the e-Co model – will be introduced in section 4. In section 5 the use of the e-Co model will be exemplified for two different purposes. The paper will be concluded by some reflections.

EXISTING FRAMEWORKS FOR CHARACTERIZING E-SERVICES

The Australian framework

ANAO (Australian National Auditing Office) has developed a model that provides criteria for government agencies to identify and decide what kind of services they can provide electronically to the public. The intention is also to help agencies understand there current e-service status and where they can go from there (ANAO, 1999). It is a four-stage model where each stage increases the sophistication of technology and complexity regarding functionality/service delivery. ANAO (ibid) illustrates the different stages with the model depicted in figure 1

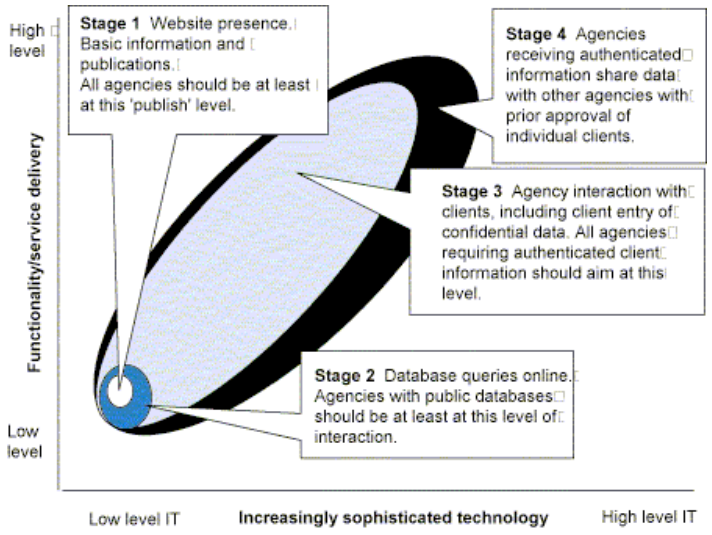

Figure 1: Stage model from Australian National Auditing Office (ANAO, 1999)

The different stages can be described as follows:

- In **stage 1** information about the agency and its services is published and displayed in a static way. Publications can be downloaded and the public access to the information is not limited. The inquiry and search facility is however limited.
- In **stage 2** web-users have access to limited interactive facilities, i.e. databases that the agency provides, where the users for example can do calculations about levels of subsidies or debts. The public access to information is not limited.
- In **stage 3** a user can, besides the functionalities in stage 1 and 2, enter information on the Website and exchange or transact secure information with the agency which requires some form of authentication or verification of the user's identity. The interaction can in this stage include financial transactions which require a high degree of security. Examples of interactions are individual taxpayers' electronic lodgment of tax returns, employers' registrations of new jobs and entering of cargo import information by import/export brokers and their clients.
- In **stage 4**, that has the same functionalities as in stage 3, the agency can after approval from the user (individuals, organizations or businesses) share user's information with other agencies. If a user changes some information, for example an address, the agency that notifies this change can with the previous approval from the user notify other agencies.

The Swedish framework

A similar model has also been developed by the Swedish Agency for Administrative Development (SAFAD) (SAFAD, 2000). The driving force for putting forward such a model is the vision of the 24/7 public agency. The model is supposed to be a joint approach for characterising e-services available, and individual government agencies are supposed to regard themselves as part of the electronic public administration for serving the public. Two fundamental values are driving the development of such model; 1) Good services for the public and businesses (availability, participation, and collaboration) and 2) transparency (inspection, individual responsibility). This model is seen as a primary yardstick of an agency's development in terms of the 24/7 agency. In the model four stages (c.f. figure 1 also), maturity levels, of development to be reached are defined (ibid) as:

- The website contains "packaged " information about the agency and the service

- The website contains "interactive" information about the agency and the service
- The website and communicative functions allows the visitor to submit and retrieve personal information
- The website and network functions for joined up services involving several agencies and institutions

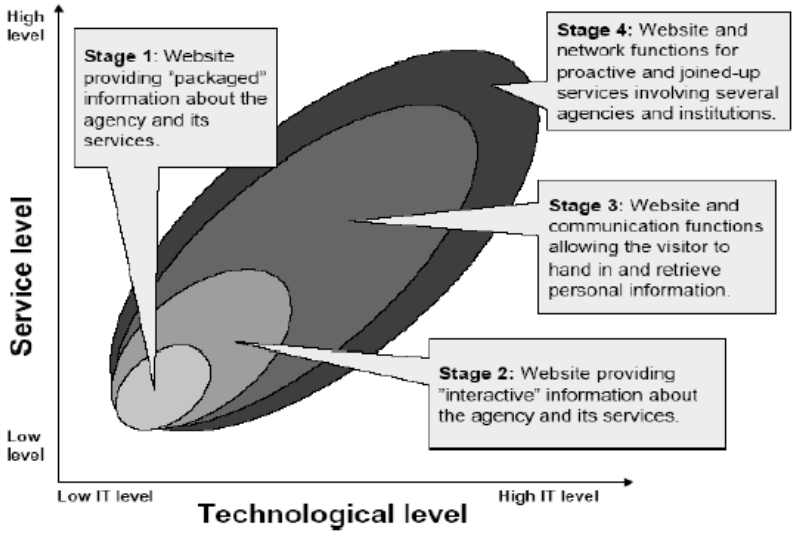

Figure 2: Stage model from the Swedish Agency for Administrative Development (SAFAD, 2000)

Two criteria are distinguished as an aid for judging the "maturity" of a government agency; 1) the ability to supply on-line services and 2) the capacity for change and adapt to the logic of digital administration.

The development of this stage model has been driven from that the notion of the 24/7 agency requires a dialogue with citizens. It is identified by SAFAD that citizens want central government agencies must first of all be accessible, service-minded, and able to state which services that are offered. Secondly, the agencies must give individual citizens and companies scope for dialogue and for expressing their views on the activity that concerns them. Thirdly, they must permit inspection and control of agencies' activities.

Important characteristics of the frameworks

Both frameworks are stage oriented models which is an area of research that has been in focus for a long time (c.f. King & Kraemer, 1984; Nolan, 1973). These two frameworks are based on the developments of the organization providing the e-service. Their starting point is the existing organization and its services. They have also an inbuilt ethics stating that a certain development is good and should be strived for. The development towards both higher service and more technological advanced levels seems inevitable and unstoppable. The two frameworks begin with a low level where the users can download information about the government agencies and the services they provide. There are no interaction and limited facilities for searches and inquires. In the following stage the level of interaction increases, but can still be classified as limited. The public have access to databases the agencies provide. The third level in the frameworks is also similar. Authentication or verification facilities are introduced that makes it possible for the user to exchange and transact information in a secure way. Also the fourth and final level is similar. Agencies can on the basis of user approval share information.

EVALUATION OF THE FRAMEWORKS

Perspective for evaluation – a co-design approach

In order to evaluate something there is a need for a value-base, perspective, to be used as a base for evaluation. In this section we introduce a co-design approach which strives at taking stakeholders' perspective and values into consideration.

It has been well known that we during systems development as well as other kinds of organisational development need to take different stake holders' interest into consideration. In his system approach Churchman (1968) put forward the need for looking into the relations to other actors in the system's environment. Goldkuhl & Röstlinger (2006) identifies a similar need in which they are identifying different stakeholders and the characteristics of the relations to different parties related to the practice in focus. Such focus means that the systems role will be determined by its role to its surrounding.

Co-design (Albinsson & Forsgren, 2004) has emerged as an approach to transform theories and models of behaviour into specific innovative environments. The concept, co-design, is based in a pragmatic social constructivist view of knowledge and technology creation (Churchman, 1971; Forsgren 1991). In co-design different social constructed views are brought into a co-design process of synthesis, negotiation and implementation. Co-design proposes that: (a) technology, work, organizations and businesses should be designed in concert with one another; (b) the design process should include design and technology experts as well as others actors who are influenced by the designed results as casual co-designers; (c) multiple strategies, methods, and tools can be used as support in the design process in order to create sketches, models and prototypes having a visualizing force; (d) continual use of an innovation, where different actor interests are espoused in action and meld together, will lead to gradual redesign. Co-design becomes increasingly challenging as the number of and differences among participants increase.

Each actor related to the system has their own view / perspective. This means that each will contribute by emphasizing a special view of reality and only in their entirety can they provided a comprehensive picture. According to the systems approach developed by Churchman and others (Churchman, 1968; Ackoff, 1981; Mitroff and Mason, 1981; Checkland, 1988), this is not enough. Every view also relates to possible actions and solutions, and these are of different values for different stakeholders. In order to act or steer the enterprise boat, someone will have to select or co-design (Albinsson and Forsgren, 2005; Forsgren, 1991) the acting model, though. Without this creative and ethical step, the practice will be hard and tricky to govern.

In the context of e-services aimed for citizens there is a need to focus the perspectives and values desired by the citizen. Other authors have also recognised the need for identifying that different parties have different roles in relation to the practice/system. In this context we conform to that the requirements put upon organisation(s) e-services is driven by the desires of the citizen. Other authors identify a similar need to identify the driving force, as e.g. Ehn (1988) who is aware of that there are many different interests in IS development, but chooses to promote one. Another example is Goldkuhl & Röstlinger (2006) who identifies the potential in putting the client's needs and the client's utilisation of delivered products as a driving force for the practice. It should also be noted that other scholars, such as Mumford (2003), emphasises the need for participation by different stakeholders in design and evaluation processes.

Shortcomings in the frameworks

The two frameworks (presented in section 2) are based on the developments of the organization providing the e-service. Before going into the criticism that could be put upon these frameworks it is also worth mentioning that other scholars also have reacted against the frameworks. One example is Goldkuhl & Persson (2006ab) who have

conceptual considerations about constituents of each stage. They claim the difficulties in separating the information (stage 1) and interactive (stage 2) stages, that the transaction level both could consist of general and individualised e-services, and that the integration stage (stage 4) is ambiguous. The same authors propose a framework with 3 polarities (separated vs. coordinated, general vs. individual, informative vs. performative) instead. Another example is Andersen (2004) who is critical to stage models where the basis is an assumption that stages occur in an evolutionary fashion. He argues instead that the stages should be seen as simultaneous activities. Andersen (ibid.) also argues that the stages should be seen as different elements of e-Government rather than a quality progression.

Based on the values put forward in section 3.1 it could be identified that the frameworks also have an inbuilt ethics stating that a certain development is good and should be strived for. This is our most important criticism of them, that ***they ignore the life situation of the citizen***. They also may hinder greater improvements. Since their starting point is the organization and its current services they will not inspire changes in current processes, organization or practice in the same way as frameworks taking an "outside" and "inwards" approach. When looking into the two frameworks presented in section the following additional conclusions can be drawn:

- The notion of information is complex! Information cannot exist without communication. How are the different e-services, independently of if the service means giving or receiving information, related to the communication situation?
- Is striving towards integrated services really the desires and needs for the citizen? A tricky part is also how the final stage could be reached when the point of departure (on lower levels) is a single organisation? Which organisation should take the leading role? How is the integrated service defined? How is the service designed if the participating organisations are on different levels in maturity?
- Which starting point is used by the organisation supplying the e-service? Is the e-service a mean to rationalise the already existing communication process without taking new needs of the client into consideration?
- What about private – public integrated settings? Could it not be the case that the citizen desire integrated services that involves both private and public providers? Should not the citizen have the possibility to organise his/her e-life by involving both private and official actors?

A great challenge though is in this context to make a standpoint whether it will be enough to just take the citizens perspective into consideration or if there is a need for have the citizens judgement and evaluation of offered / desired e-services based on the life situation of the citizen.

THE E-CO MODEL

Basic assumptions

Our point of departure is the thought that citizens and private persons, in companies or in other organizations, strive towards creating better conditions and living situations. This point of departure will consequently also include those associations, companies and organizations which the individual is loyal to (Churchman 1979; Forsgren, 2004). In striving towards this, the individual basically has four aspects to consider (see figure 2):

- What do I/we want to achieve? (The Vision)
- What does the situation look like today? (The current situation)

- By which means do I/we go from today in order to arrive at desired goals? (The means to change)
- A rational individual should also be able to reflect over whether the situation has become better after the realization of the three first points (The reflection).

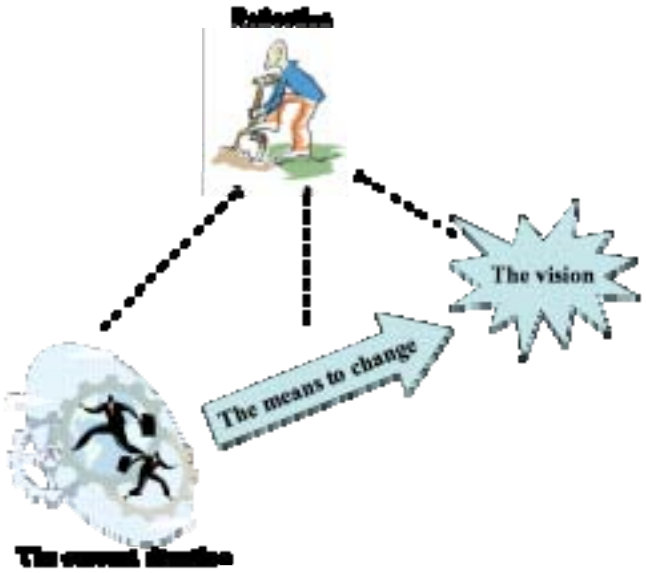

Figure 3: The e-Co model

It should be noted that the e-Co model put forward a focus on individual's rationality rather than organisation's rationality. The e-Co model is not a representation of the world (depiction); it is rather a design model, a tool, stimulating individuals to reflect about their rationality to act in different situations. This model could simply be demonstrated by an example from the social care sector when you as a citizen with a new baby need e-service supporting you to a good life.

- *The citizen can have a vision of a good mix between home and working life (The vision)*
- *The citizen can describe the situation of today –before the baby (The current situation)*
- *The citizen can use different offers and services to reach the good mix of home and work life. (The means to change)*
- *Finally, the citizen can also judge if the services really helped in reaching the vision. (The reflection)*

The model represents four steps where the last step connects into the first step in a reflection of "did I reach my vision and/ or has my vision changed now so I need to go another round in the model. The underlying assumption in the e-co model is that individuals who develop their "vision" have created a higher value for himself/herself.

It also has to be remarked that a citizen always are in a context with other people and technologies. The citizen looking for a good life with a baby, at least has to consider the interest of the baby. In this sense the fundamental assumption behind the model is that e-services often are impacting more than one person with his or her vision of a good life. The e-service is in this sense an *e-co* service.

e-Services in the e-Co model

According to this framework it is possible to say that all offers that could contribute to a more desired situation for the individual and/or the family/company/organization could be described as a good e-service. The naming of the model has its roots in that the evolvement of **e**-services is a continuous **co**-design process taking different stakeholders values into consideration. In the context of having citizens driving the e-service quality it is natural to let the citizens life situation as the point of departure for considering offered / potential e-services.

Offers of e-services could be about:

a) Help in creating visions and ideal future scenarios of what could be worth striving for (future hope/vision/goal)

b) Help in revealing understandings about the current situation (problem awareness)

c) Help to go from the current situation to a desired future situation (measures/means)

d) Feedback about how offers, actions and measures taken has contributed to the arrival at desired visions (feed-back)

Visions as critical phases in life

In many e-service models one could anticipate a perspective on the life cycle with critical phases such as birth, child care, compulsory school, university studies, sports, leisure time, work, marriage, divorce, sickness, and death. Translated into the e-Co model these critical phases represent different visions. One wants to have a child, leading one to want baby sitters, etc. From such a perspective the visions behind existing e-services could be identified and thereby different clues concerning the need for new e-services could be identified. On the other hand, there is also a rapid expansion of new e-services. Such an effort to identify clues might therefore be of less value.

This conclusion is strengthened by the fact that the amount of private service providers rapidly increases within what we traditionally have regarded as public areas, such as in the health care area. In the e-co model there is no distinction made as to whether e-services are distributed by public authorities or private companies. In fact applying the e-co model to a set of e-services will in most cases show better results indicating higher quality if the e-services include both public and private service offers. An e-service for child care will most truly be regarded of higher value to the citizen if both private and public day care centers are included.

Many municipal portals represent an interesting development since these to a higher extent try to cover the citizens' critical phases in life. A key question with regards to this attempt is how private service providers are allowed to be present in the portal. One can say that municipalities and authorities create a new type of market place for private and official service providers by making this possible.

Feedback and stimulation of the development of new and refined e-services

Even though we cannot identify many services today that allow for feedback, several municipal portals cover feedback services that aim to give input to new and refined e-services. Such services are often regarded as feedback leading to a learning experience for the organization. When the service covers a more extensive service influenced by several people the e-service is often regarded as a service aimed towards e-democracy.

PUTTING THE E-CO MODEL INTO PRACTICE

There are two major uses for the e-Co model; first to evaluate services and second to design them.

A first evaluation of e-Services according to the e-Co Model

In a project study 335 Swedish services forming the response from a questionnaire were studied. (Albinsson et al 2006b) Out of the 335 e-services, the 50 first e-services in the questionnaire were evaluated according to the e-Co Model with respect to division of vision, current situation, and measures to achieve the vision according to the e-Co model (3 out of the 4 dimensions described above). In such an exposition we acknowledge that a majority of the services (32 %) uniquely represent measures while a minority of the services (4 %) uniquely represent support for arriving at the vision (see figure 4). We also acknowledge that only 12 % of the services include all three steps: This is what we want to achieve, here we are today and these are the measures that the service offers. The first three categories depicted in figure 4 represent e-services uniquely focusing on any of the three steps, the following three categories represent e-services including two of the steps, and the last category represents e-services including all three steps.

In many of the cases when some part(s) of the model are left out this/these omitted part(s) are taken for granted. As for the example of healthcare, one could say that information about painkillers consists of information relating to a cure to a present state of pain. Services regarding feedback and democracy are seldom represented and could potentially be an integrated part of the pinpointed services.

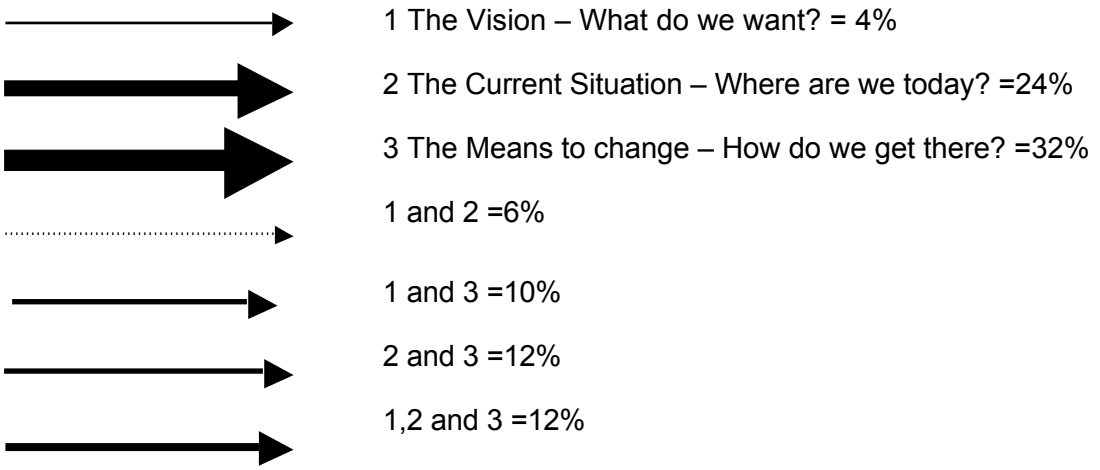

Figure 4: Categorization of the first 50 e-services according to the e-Co model

Even though the study is not quantitative sound, we believe the overall impression is useful. It clearly indicates that fragmentation of e-services, they are focusing means to accomplish something but not in a context supporting citizens to figure out what they really would to accomplish. The "current situation" parts in most cases gives only support in establishing if the citizen is eligible for whatever "change" that is offered, they do not support the citizen in the generating a useful image of the "current situation" larger context of their lives.

This evaluation has, however, a great flaw; it is done by researchers and the staff of the service provider. The ultimate judge of what citizen value a e-service provides in the citizen and therefore the targeted citizens should be asked to perform the evaluation.

This forms part of the ethics in the e-Co Model. Current models derived from the organizational perspective, do not per se force a citizen perspective, they may even *justify* an internal development perspective. This leads us to suggest using the e-Co Model, in the design of e-services.

Using the e-Co Model in design of e-Services

The e-Co Model can also be used in the design of e-Services. It will encourage service designers in engaging the target citizens in a dialogue on the service and its context. There are numerous reports on the lack of citizen perspective in the development of e-services rendering these flawed or at worse useless or unused. Many services are today developed as an e–ificaiton of existing services, without considering that fact that for the citizen a number of services may be need to completed, before a matter is settled. Forcing the service designers to also consider the context of the service (c.f. figure 5 for an example of how to contextualise e-services) is likely to encourage collaborative development. One example in which the e-Co model has been applied in practice in a design mood is the Vinnova financed e-Me project (c.f. Albinsson et al 2006a).

Figure 5: Example scenario using the e-Co model (from Albinsson et al, 2006a)

The goal of this project is to generate IT-solutions in a student centric way. In the e-Me project the focus is on the students and their ambitions to find out knowledge about their own ideal situations so they can try to find and select matching resources. In this project several design workshops has been run in order to grasp what the students of today find; 1 to be ideal study situations (Vision), 2 The problems of current situation (problem awareness), 3 e-Me as a provider of changing current situation closer to the vision (means). 4. In a pilot study the students finally are encouraged to evaluate if and how the situation has become closer to the vision and also if the vision has changed. These problematic issues of the students concerns administrative tasks as well as issues

that restrain the desired life situation for the student. Ideal-oriented design using a special scenario technique has been used by the students to express their ideas (c.f. Lindell et al, 2006). In the e-Me Project students have been engaged to design their ideal electronic assistant. The Cartoon depicted in figure 5 shows part of a Monday morning scenario. The Vision is to be on time at university, while still not be forced to leave too early. The Current Situation is students often are late or have to leave early. The Means is an assistant that keeps tabs on the traffic situation. The Feed Back is the ability to instruct the e-Me to behave differently.

CONCLUDING REMARKS

This paper has taken as its starting point the problem that the driving force for many of the public e-services evolving today relies on a rationality to increase efficiency and decrease costs. This means that there is a high risk that these e-services are developed to not suit the different needs and desires that the citizen has. Two frameworks governing evaluation and design of e-services have been looked into. These are stage-oriented and have an inbuilt rationality that integrated e-services, such as one-stop government is desired. Several stages of maturity, on the way to this desired integrated level, are defined within these frameworks.

From a stakeholder, and co-design, point of view these frameworks ignore the life situation of the citizen. Behind these frameworks there are no incentives for inspiring changes in current processes, organisations or practices. It seems that statements in the frameworks try to take a citizen perspective, but how are citizens' desires and needs derived? It could therefore be claimed that there is a need to involve the citizen more actively in the co-design process, not just trying to take the perspective of the citizen into consideration. Such an approach would then be limited to the knowledge about the citizens that designers/decision makers have. It is therefore claimed that such an approach ignore life situations of the citizens.

In this paper another model is therefore proposed as a complement, the e-Co model. This model takes as its starting point the life situation of the one that the e-service is aimed for, in this case the citizen. Four dimensions are focused; *the vision*, *the current situation* (problem awareness), *the means to change*, and *the reflection* whether the situation has become better after the realisation of the three first points. In the context of public e-services such services should be evaluated whether these support in developing the citizens understanding of the four dimensions.

The e-Co model also meets additional criticism identified when looking into stage-oriented frameworks. First of all, the e-Co model relies on e-services as tools for communication. Citizens communicate with private and official organisations by using e-services. Secondly, the e-Co model takes as it starting point the citizen's life situation in determining the desires and needs of more or less mature e-services. This also means that the analyst could frame himself/herself from existing communication patterns. Since the citizen's life situation will be taken as the starting point desires and needs for private and public service integration could also be identified.

In this paper we have reported upon the use of the e-Co model in two situations; the evaluation of public e-services and the design of student-centric e-services (within the

e-Me project). The latter effort has also meant that private and public e-services need to be considered jointly. In these two situations we have found it very powerful to use the e-co model. In the e-Me project we have managed to derive e-services desired by the students and in the first situation we have been able to say something meaningful about what the e-services are aimed towards.

We can now acknowledge two future steps in the application and development of the e-co model. First of all it would be interesting to see what it would mean to apply the model in deriving the desires and needs of e-services by companies. Secondly it would be interesting to see which role the e-co model would have in continuously improving offered e-services.

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