FROM E-LADDER TO E-DIAMOND
– RE-CONCEPTUALISING MODELS FOR PUBLIC E-SERVICES

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Abstract

There is rapid growth in the development and launching of new public e-services to citizens. In doing this, government agencies base their work on national and international programs for e-government development. Many such programs include a stage model for public e-services. Many such models comprise stages of 1) information, 2) interaction, 3) transaction and 4) interaction. The wide spread use of such stage models (e-ladders) give rise to several questions. Are the categories of a stage model well chosen? Do e-services evolve through such a series of stages? Is there a real advancement between the different stages? Should one always strive for higher stages? Are higher stages inherently better than lower stages? Is a stage model a proper yardstick for evaluation and benchmarking? The paper pursues a critical examination of such stage models (called e-ladder). A conceptual analysis of stage models is performed based on a socio-pragmatic foundation. Empirical examples are given that show weaknesses in the assumptions and conceptualisations of stage models. An alternative model - the e-diamond - is presented consisting of three polarities (informative vs performative; standardized vs individualized; separate vs coordinated).

Keywords: e-government, public e-service, stage model, socio-pragmatism.

1 INTRODUCTION

The interest for public e-services is rapidly growing. Government agencies are developing and launching e-services in large proportions. These endeavours are partially governed by national programs (e.g. Government On-Line in Canada and The 24-hour agency in Sweden) and there are even programs on the EU level (eEurope, 2005). Such national programs bear visions and impetus for e-service development. Such programs also prescribe development paths for the growth of e-services. These development paths are often described as maturity models. The development of e-services will go through a series of stages. E-service evolution is seen as a move up a ladder. Government agencies should strive for higher steps on the e-service ladder. For example in Sweden where SAFAD (Swedish agency for administrative development) is responsible for guiding and supporting the government agencies in the realization of the eGovernment vision, a stage model is used for guiding and evaluating the progress (Statskontoret, 2000) .The Swedish model is structured in four stages: 1) Information, 2) interaction, 3) transaction and 4) integration. This stage models has great resemblances with other stage models, e.g. an Australian model (ANAO, 2000).

Such models are not only used as a template and source of inspiration for e-service development. The assessment of e-services is made based on such ladder models as yardsticks. This is the case for single government agencies as well for benchmarking on a national (Statskontoret, 2004), European (eEurope, 2002) or global (UN, 2003) basis. A very similar model as in Sweden has been used for benchmarking the programmes eEurope 2002 and 2005 with slight differences. (eEurope, 2005). The

consultancy firm Cap Gemini in their fourth measurement published in October 2003 conducted this benchmarking study for the European program.

The wide spread use of such stage models (e-ladders) give rise to several questions. Are the categories of a stage model well chosen? Do e-services evolve through such a series of stages? Is there a real advancement between the different stages? Besides such ontological questions concerning stage categories, there are other questions of normative and prescriptive nature. Should one always strive for higher stages? Are higher stages inherently better than lower stages? Is a stage model a proper yardstick for evaluation and benchmarking?

The purpose of this paper is to address these questions and to give some answers to them. We think that it is very important to take a critical stance towards e-service stage models, since they seem to be taken for granted both in academia and in government. It is time to challenge the prevailing conception of e-service models as ladders. A main contribution of the paper is a proposal to replace such a ladder model for public e-services by a diamond model. We will achieve this through a combination of conceptual and empirical analyses. The paper is organized as follows: In the next section we will investigate some stage models for e-services. After that we explore conceptual foundations for e-services. In section 4 we critically examine the ladder models for e-services and present a diamond model as an alternative. We will give our conclusions in section 5.

2   STAGE MODELS FOR PUBLIC E-SERVICES

This section presents some stage models and places the concept of stage models in its historical context. We have for our description and analysis selected models well-known in academia and practice. A more thorough analysis has earlier been presented in Persson & Goldkuhl (2005). These stage models have varying purposes described below but in general terms they bear the basic features in common. All divide the development of eGovernment into several stages; all of them bear a deterministic characteristic in describing a development from a simple information service to a more refined one-stop government. The concept of stage models was originally founded to discuss the adoption and maturity of information systems management strategies from the operational level to the strategical level of organisations (Nolan, 1973). This concept of modelling later came to use in other fields of technology adoption such as Intranet adoption (Damsgaard, 2000) among other areas. In the area of eGovernment research there has been a large number of variants of the stage model concepts presented by various sources. Some models originate in the research community (e.g. Layne & Lee, 2001; Hiller & Belanger, 2001) and others originate from the practice field (e.g. ANAO, 2000; Statskontoret, 2000; UN 2003) Frequently referenced models are the Layne and Lee (2001) model and the Hiller and Belanger (2000) model as well as the UN Web Presence Measurement Model (UN, 2003). In Sweden the SAFAD model is widespread and adopted by agencies in classification of service output and guiding and supporting the progress. Our experiences are that this model is widely used for these purposes in Swedish agencies and municipalities in order to position their e-service efforts. As stated in the introduction we have no ambition in this paper to present a complete review of all present stage model variants that have been presented in various contexts. The purpose is to discuss the conceptual clarity of these models in general and especially the SAFAD model presented below. The models that were found during the research process in order to write this paper divide the e-government evolution into 4, 5 or 6 stages. As stated we focus the discussion on the SAFAD stage model presented in detail below. In addition to this model a selection of other models is presented to provide a ground for discussing the general similarities these models bear in common.

2.1   ANAO model

This model is developed by the Australian National Auditing Office to categorize the government agencies electronic service delivery via the Internet. This model divides the delivery of services into 4 categories or stages, indicating that this is a model pivoting the emerging e-services and the development of e-services. The purpose of this model is to be the basis of auditing work conducted by

this organization and to help government agencies in finding what services to deliver online (ANAO, 2000). *Stage 1: Publishing information* is providing static information about the agency and downloadable and readable publications from the agency to the users are the pivoted and focused issues. Access to information is not limited. Interaction between user and e-service are limited to an inquiry and search functionality. *Stage 2: Interaction* involves limited interaction possibilities in government agency databases to the users. This is done with expanded search and filtering possibilities as well as calculation services for calculating, debts or levels of government subsidies. There is still no limitation regarding accessibility to the site and services. *Stage 3: Transaction of secure information* requires secure identification related to the individual interacting with the government agency. Data access is restricted to a specific individual who is provided personal information and services. The providing of personal information requires a higher level of secure channels between agency and the user. Example services are retrieving cargo import information, and lodgment of tax returns. Creating services on this stage involves addressing risks involving security, privacy and financial transactions. What separates this stage from the two prior stages is the need for secure identification of the user identity. *Stage 4: Sharing information with other agencies* covers the exchange of information between different government agencies regarding a specific user (a business, an organization or an individual). ANAO exemplifies this with an agency notified of a change of address, a bit of information of interest for all government agencies involved in providing services to this individual. This information is to be shared with these other agencies. As in stage 3 this exchange of information need the user to be identified to make sure that the information provided and spread is correct.

2.2 SAFAD model

The Swedish Agency for Administrative Development (SAFAD; in Swedish Statskontoret) has presented a stage model, which is highly influenced by the Australian model (section 2.1 above). The SAFAD model is based on the assumption that technology and service levels are intimately interwoven factors in the emerging eGovernment services. As in the Australian model there are diagonal stages apparent that according to SAFAD are clearly distinct from each other in functional terms.
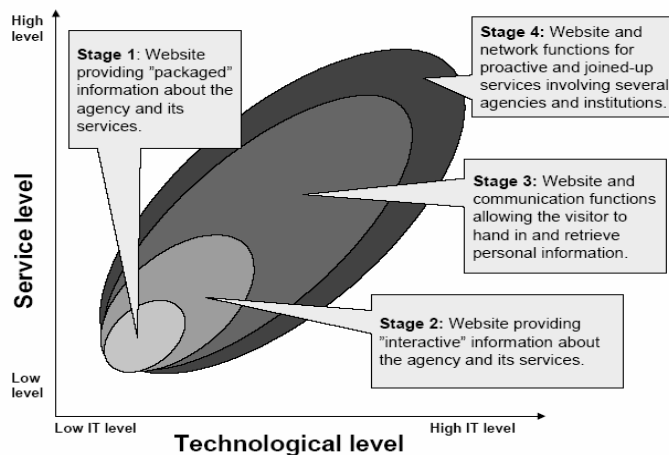

Figure 1.   Stage model from the Swedish Agency for Administrative Development (Statskontoret, 2000)

Stage 1: Information pivots on the presentation of static material such as publications and information about the services provided by the agency. SAFAD describes this information as "packaged" by the agency with only limited possibilities to interact with the website. This functionality is basically limited to search and inquiry as in the Australian model above. According to SAFAD this stage include services such as presenting the mission of the agency, parliament bills relating the services of

the agency and providing mail access for inquiries. *Stage 2: Interaction* is according to SAFAD providing "interactive information". This includes the possibility for basic interaction with the website. At this stage services as searching in agency databases, ordering printed publications, downloading and ordering forms relating agency services and subscribing to newsletters from the agency. This stage range from completely public services such as searching in databases to basic identification of the client that is limited to email addresses or mail addresses. *Stage 3: Transaction* includes picking up and leaving personal information related to the services provided by the agency. This includes initiating and following agency specific services by the agency. To be able to provide this type of services online the client need to be securely identified. This stage ranges from initiating a simple case with identification of the client to more advanced transactions such as tax declaration online. *Stage 4: Integration* addresses the integration of services between government agencies. This is the realisation of a one-stop government that regardless of organizational boundaries provide services at one point of entry even where several agencies are involved. Addressed at this stage is the complete process of a service provided online, from initiating the case to paying the service, tax or what the service is about online. This mean that the organisational boundaries in the government structure is somewhat erased or is left with no or little visibility to the clients.

2.3 Layne & Lee model

This model is derived from observations on the evolving eGovernment in the United States. Although the model is derived from research and experiences from a federal government structure it can be used on other government structures as well. Layne and Lee (2001) state that the model (and the related discussion) initiate from the state level but can be used on federal as well as local level. Layne and Lee see the development of government agencies as a natural progress in which the agency evolves because of and in response to functionality needs and citizen expectations. In the realization of these four stages the result will be true one-stop shopping for the citizens. *Stage 1: Catalogue* focuses on establishing an online presence for the government agencies. This includes the efforts of many government agencies in the basic web development of presenting information about the agency and publications made at the agency. According to Layne and Lee the movement into this stage is initiated because of external pressure in terms of citizen and business expectations. The name of this stage, catalogue, is derived from the typical functionality that is afforded by the agency. The agency will at this stage publish documents and information that is of general nature. This is information in general terms about the agency and its services. At the end of this stage the agency will address the need for an organised portal site that present the published documents and information in a structured and usable way. *Stage 2: Transaction* according to Layne and Lee represents a focus shift towards integrating the internal systems in the agency with the website. In doing this the agency will allow the clients to interact with personal information in transaction-based services provided by government agency. This stage will allow citizens to renew licences and pay fines online in integration with agency internal systems. The end of this stage will according to Layne and Lee be focused on the full integration of agency systems with the web interface allowing the transactions between client and agency to be posted directly into the agency systems minimizing the interaction with agency staff. *Stage 3: Vertical integration* and the last stage are based on the distinction between government functions and government levels. The vertical integration addresses the integration between different levels of government but in the same functional areas. Layne and Lee exemplifies this with the integration of local level business license application being linked to state and government level to obtain an employer identification number. In other words this stage will consist of the linking of local level systems to higher-level systems. *Stage 4: Horizontal integration* focuses on the integration of information systems in government agencies with different functionality that has some relation in common to the clients. An example of horizontal integration is the possibility to pay different business fees and taxes to different agencies at the same time because of the integration of these systems in the different agencies. These last two stages involve that the government agencies will not only address publishing information, information systems development and integration of website and internal systems but the organisational development in focusing on the processes in the agency relating to other government agencies.

2.4   Hiller & Bélanger model

This model by Hiller and Bélanger (2001) differ from the models above in adding a fifth stage stating the importance of political participation. This is a clear distinguishing aspect that single out this model among the presented models. *Stage 1: Information* is according to Hiller and Bélanger the most basic form of eGovernment, where information is simply posted on the agency website. These information websites contain general information about services provided by the agency and information directed towards the public including businesses, politicians or other government agencies. The biggest challenge is to maintain the quality of information to ensure that the information is updated and accurate. This stage is implemented to a high degree in the government agencies. *Stage 2: Two-way communication* is when government agencies allow users to interact with the agency in simple requests. According to Hiller and Bélanger this is often the case of email services provided by the agency. This stage includes services as requesting information from the agency or requesting the government agency to send back personalised services via mail or email. Hiller and Bélanger exemplify this as applying for new Medicare cards or benefit statements from the government. *Stage 3: Transaction* is when government agencies provide the possibility to interact with the agency and to conduct transactions completely online. According to Hiller and Bélanger this is the most advanced level of eGovernment widely available. Services at this stage can be renewing licences for businesses and individuals and paying fines and taxes online. At this stage public servants are replaced at large extent by the possibility for clients to conduct self-services online. *Stage 4: Integration* contains the integration of government services. This can and is most frequently done with a single portal allowing clients to access services at a single point of entry. By using a single point of entry clients can access services at one place no matter what agency that actually offers them. One of the biggest obstacles according to Hiller and Bélanger are the lack of integration of back-office systems between government agencies. Integration of back-office systems and online services could mean saving a lot of time and resources for the government agencies involved. *Stage 5: Political participation,* the last stage of the model, contains political participation and includes services such as voting online and posting comments online. Hiller and Bélanger argue that although this can be seen as a part of stage 2, two-way interaction, the importance of the political dimension motivate a separate category or stage for this type of services. Currently there are very few services available that fall into this category. The uniqueness of the privacy and security concerns in this stage is one of the main factors behind stating this as a separate category. In the future of transaction-based eGovernment include the possibility of voting online.

2.5   Comparative discussion

All of these models start off with a stage of providing information to the public. After this stage the models begin to differ from each other in a more substantial way. ANAO and SAFAD continue with an interaction stage where there is increasing interaction between agency website and the client. Hiller and Bélanger continue in their second stage with two-way communication a stage where the client and agency exchange email and order publications in communication with the agency. The third stage in ANAO, SAFAD and Hiller and Belanger and the second stage of Layne and Lee are more or less the same. At these stages the client and agency exchange personal information about the client in a secure fashion. There are however some important differences between these stages. SAFAD is focusing less on financial transfers between client and agencies; the other models state this as an important feature of the applicable stage. The models by SAFAD and ANAO are very similar altogether. The division into 4 stages that are basically the same except for the last stage where SAFAD pivot the realization of networking agencies and ANAO limit the discussion to sharing information. We argue that the sharing of information is only a small part of what integration of government agencies will include. The next step in the models is the integration of government agencies. In Layne and Lee this is divided into vertical; cross-hierarchal integration and horizontal; cross-functional integration. The other models do not separate the cross-functional and cross-hierarchal integration from each other. Only one model (Hiller and Bélanger) among the presented models discusses the participative dimension of

eGovernment. This is in our view a different dimension with a very complex nature best left to discussions on eDemocracy. Hiller and Belanger discuss eDemocracy in their model in terms of more sophisticated privacy and integrity concerns needed but we consider this to be a bigger issue. It contains a whole range of issues like the view of representative democracy, digital divide and other areas that motivate that this should be handled like another dimension of eGovernment and as such a separate discussion than enhancing the administrative side of governments.

The stage models in circulation serve several purposes. One purpose of these models is the predictive function of making prognoses of what future eGovernment will be like. This is the case of Hiller & Belangers (2001) last participation stage of evolution where the assumption about the future is that e-voting and participation in the shaping of politics will take place through eGovernment services. The same prognostics are apparent in the Deloitte (2000) model where the total reformation of the organisational model of government agencies into a customer and service oriented integrated web-presence. Although less radical all of these identified stage models bear this prognostic characteristic in common when stating what the later stages will be like. Another purpose of these models is the classification aspect. These models (e g ANAO, SAFAD, UN, Cap Gemini, Layne & Lee) have been used to classify services in order to evaluate or benchmark progress of eGovernment evolution or adoption among countries or among agencies in countries. In doing this the assumptions of evolution time lines and the ability to distinguish e-services on different complexity levels from each other is central. There has been some criticism aimed at stage-models. Kraemer & King (1984) present criticism towards the different variants of Nolan's model and doing so questioning among other aspects the empirical foundations and the evolutionary aspect of the model. As models for predicting future evolution of technology adoption the Noland model can be questioned on the same basis as other evolutionary models as only being able to verify by waiting to see of their assumptions were true (ibid). In the area of eGovernment similar criticism as we present in this paper has been articulated towards the models in this field, primarily the Layne & Lee (2001) and a model by the World Bank by Andersen (2004). Andersen's criticism pivots on the evolutionary and quality assumptions of stage models. The evolutionary assumption is that the stages occur in this predescribed order; first stage I occur and then stage II and so on. Andersen states that in practice these stages will occur simultaneously. The criticism of the quality assumptions is directed towards the assumption that stage IV is better than stage III and so on. According to Andersen these stages represent different elements of eGovernment rather than a quality progression. Andersen states that pivoting on the triggers for entry between stages is more rewarding to study than benchmarking on which stage eGovernment evolution currently is (ibid).

However, as stated above, eGovernment stage models are actually used for benchmarking purposes and in doing this the e-services are classified according to the stage categories. This application area is central for several of the identified stage models. The focused SAFAD model serves this purpose in discussing the progress in Sweden (Statskontoret, 2000; 2004), the model used by Cap Gemini in order to benchmark the eEurope programme (e-Europe, 2002; 2005) also serves this purpose as well as the UN model (UN, 2003).

3 A SOCIO-PRAGMATIC FOUNDATION FOR CONCEPTUALIZING PUBLIC E-SERVICES

In order to understand and evaluate the different stage models described above we need a conceptual framework. We need concepts to interpret and analyse the different stages; the meaning of each stage and differences between stages. An e-service means usually that an external user (a citizen) interacts through a user interface of a public IT system based on web technology. The citizen searches for information or provides some information to the government agency. An e-service means communication between citizens and a governmental agency. As a conceptual basis we need a framework that exhibits not only human interaction with a web interface, but also communicative and organisational aspects of IT usage. We need a framework that may encompass both detailed issues of user interfaces and broader issues concerning cross-organisational communication and interaction. We

turn to information systems actability theory – ISAT (e.g. Ågerfalk, 2004; Sjöström & Goldkuhl, 2004; Goldkuhl et al, 2004). ISAT is based on a synthesis of language-action theories, semiotic theories, social action theories and other socio-pragmatic frameworks (Goldkuhl, 2005).

In Sjöström & Goldkuhl (2004) and Goldkuhl et al (2004) a communicative model of user interfaces is presented. This model is based on semiotic foundations; mainly the differentiation of semiotic functions made by Bühler (1934). Three basic functions are identified: 1) Symptom (an expressive relation), 2) signal (an influence relation) and 3) symbol (a referential function).

This semiotic view emphasises signs as objects of communication. A sign is an expression of the locutor. It is as a signal directed towards an addressee and it refers to some state-of-affairs (the referent) through the symbolic function. Someone says something about something to someone. Sjöström & Goldkuhl (2004) used these semiotic foundations to develop a model of communication through a user interface. We use this model here and adapt it to an e-service context (figure 2).

This means that a public e-service system is a system for communication between a government agency and citizens. Our focus is on what is done through the user interface of the e-service system. The agency uses the user interface as a way to communicate to citizens. Information is given to the citizens. An e-service system can also be used as a means for citizens to communicate with the agency. If so, there must be an action repertoire of the e-service system to afford this to the external users; more exactly there must be a proper formulation repertoire (Goldkuhl et al, 2004). The action repertoire of the e-service system is a communication to the (external) users what they can do with the system (Andersen, 2001; Goldkuhl et al, 2004). We can distinguish between a reading repertoire (what agency information can be read from the system), formulation repertoire (what can be communicated through the system to the governmental agency) and navigation repertoire (what possibilities to move around in the e-service system and to other related services/systems).
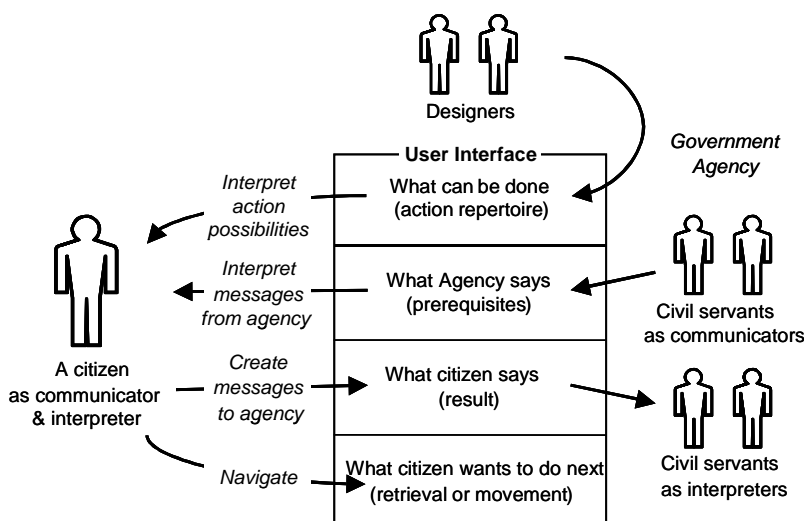

Figure 2.   *A communicative perspective on user interfaces - adapted to public e-services; (based on Sjöström & Goldkuhl, 2004)*

4   FROM E-LADDER TO E-DIAMOND

We are now prepared to analyse the e-ladder model. We will use the SAFAD model described above (section 2.2) as the main analysis object. As said earlier, the differences between the different stage models are not significant. We will try to conceptualise differences between different stages in a more clear way than has been done in the ladder models. This means that we will pursue a comparative analysis of stage categories. The conceptual framework, introduced in section 3 above, is a lens in this

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analysis. We will make comparisons in pairs which mean that two adjacent stage categories will be investigated in order to clarify meaningful and fundamental differences. Such a conceptual analysis involves searching for categorical opposites. We have taken the stage categories as a point of departure, but we have not been bound to the stage structure. First we have searched for fruitful categories, and then we have created a befitting structure. This resulting structure consists of three polarities which are interrelated in a "diamond model". We have used some small empirical cases to clarify and initially ground the diamond model.

The two first levels (categories) are "information" and "interaction". It is however hard to make a sharp distinction between an e-service that is plain information and one that is interactive. The use of e-services normally involves some interaction by the user. An external user is clicking and surfing around at a public website. This is rather interactive even if it is only navigation in pre-published information pages. One way to make a distinction is to conceive the second level as selected information; e.g. the result of a retrieval in a searchable data base. This is a distinction possible to make from the SAFAD model. This distinction should be between *pre-arranged information* and *selected information*. Selected information is generated based on search criteria provided by the external user. However there are other indicated differences. Another mentioned example is the download of application forms which can be filled and sent by the citizen to the agency. This means that the government agency affords possibilities for the external user to perform certain tasks. This is a more distinct clue to a meaningful differentiation. We can distinguish between informative and performative e-services. *Informative e-services* are only aimed at reading information from the agency. *Performative services* afford the user to pursue communicative tasks. Thus, we re-conceptualise the two first levels to be a distinction between informative e-services and performative e-services. Informative e-services can be pre-arranged or selected. This differentiation is thus a sub-classing of informative services. Selected can be considered as more advanced, since it requires search parameters from the user.

We move to the third level in the stage model. This level is called transaction. The main feature in this level is the possibility to perform an individualized interaction. The need for a secure identification is well acknowledged on this level. If such secure identification is afforded, it is possible to perform transactions between the individual user and the agency. In the case with "information" and "interaction" (level 1 and 2 in several stage models) the agency is interacting with everyone. On the transactional level, the agency is interacting with a particular user, not with anonymous mass. The differentiation between transactional e-services and the other e-services seems to be the *degree of individualization*. The transaction level is individualized e-services. The opposite is general (standardized) e-services. The conceptual differentiation is between *individualized* and *general e-services*. Persson & Goldkuhl (2004) have made a differentiation of individualized e-services into directed actions and constrained actions. Constrained actions are those that require a fully secured identification. Directed actions are those which involve personal identification but no secure identification is needed. The delivered information is directed to the external user and considered as of no interest to others but not of confidential character. This means a sub-classification of individualized e-services into *secure* and *non-secure services*. Secure e-services should be considered as of more complex character than non-secure e-services because of the application of more demanding privacy legislation.

We move to the fourth stage. This stage is often called integration. This means services from different agencies that are usually integrated in one website. Sometimes this is done in a so called "one-stop government". What is the difference to services below this level? What is presumed at lower stages is that those services are not integrated but rather separate. Each agency affords its own e-services. When one moves to the fourth level, an integration of services from different governmental agencies is made. The differentiation is between separate and integrated e-services. We find, however, the concept of integrated e-service problematic. Is it always so that different services are fused together? We doubt that. "Integration" cannot always mean an amalgamation of e-services due to legal and organisational reasons. We prefer a softer categorization. Instead of integration we prefer to speak about coordinated e-service. *Coordinated e-services* are contrasted to *separate e-services*. Coordinated e-services can

however be sub-classified into *fused services* and *aligned services*. Fused services are those that are amalgamated into one service with no visible differences between the constituent services. Aligned services are those that are put together on one uniting website (probably often a portal) but still identifiable as differentiated services.

What has this analysis of e-stages implied? Has it just been a re-labelling of stages? No, we aim further than re-naming stages in a fixed ladder model. The result of this analysis is the identification of three polarities (figure 3). We have *deconstructed* the stage models into these polarities. Besides re-labelling and re-conceptualising, we have identified two categories only implicit in the stage models. The opposite of individualized transactional e-services are *general* e-services. The opposite of coordinated (integrated) e-services are *separate* e-services. These are two important categories of e-services which should be acknowledged when theorizing or strategizing around e-services.
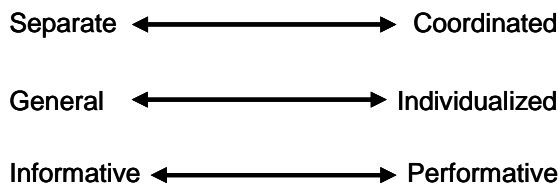
Separate ⟵⟶ Coordinated

General ⟵⟶ Individualized

Informative ⟵⟶ Performative

Figure 3.   Three polarities of e-services

As described above, there are sub-classes of these e-service categories which should be recognised. The sub-classes are shown in figure 4.

| Separate | Coordinated | |
| | Aligned | Fused |

| General | Individualized | |
| | Non-secure | Secure |

| Informative | | Performative |
| Pre-arranged | Selected | |

Figure 4.   Categorisations of e-services based on three polarities

This deconstruction of stage models into the three polarities gives rise to several questions. Does a normal evolution of e-services go through a movement from informative to performative and further to individualized and ending up in coordinated services? This is the equivalence in stage models (starting with information and proceeding through interaction and transaction to the top level of integration). Are individualized services always more advanced than performative services? In stage models transaction is seen as more advanced than interaction. Are coordinated services always more advanced than individualized services? In stage models integration is seen as more advanced than transaction. We recognize that the service categories at the right in figure 3 and 4 are more advanced than those at the left. But we find it hard to argue that those services placed lower in the figures are less advanced than those placed higher. These are rather three separate dimensions and they cannot easily be compared. This means that we do not find it appropriate to construct a simple ladder model based on these deconstructed categories. The alternative model that we present, instead of a ladder model, is what we call a diamond model. This e-diamond model (figure 5) consists of the three identified

polarities. Those service categories at the higher parts of the model are considered more advanced than those at the lower parts. We do not however rank the three different polarities. A coordinated service is not considered per se as more advanced than an individualized service. Those dimensions are, as said, not easily comparable.
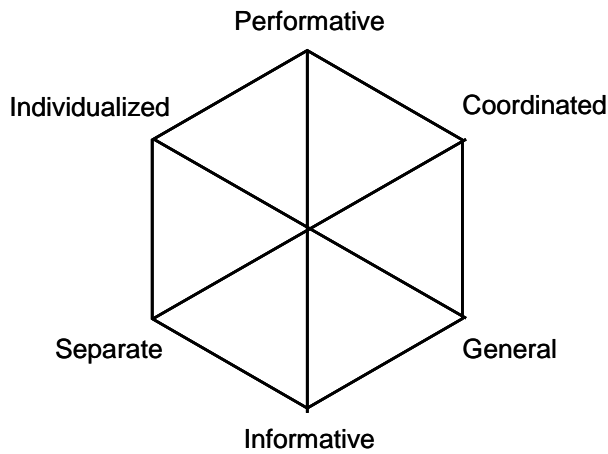

Figure 5.   E-services according to the e-diamond model (three polarities)

We will now complement our conceptual analysis with some brief empirical examples. These examples give support to the diamond model. Some of these examples do also function as falsifying the e-ladder model. One assumption behind the stage model is that higher stages include lower stages. An integrated service is not only integrated, it should also be transactional (individualized), interactive and informative in a stage model. We question this assumption both on conceptual and normative grounds. We will below present empirical evidence which thus also question this assumption on empirical grounds. Are there cases of e-services which are, for example, coordinated, general and informative? Such services are only integrated and informative according to the e-ladder conceptualisation. Such a service does not include any individualized or performative service! One example of this is a portal for driving license information. This portal gives only information about driving licences and how to apply, learn and test. It is general, non-individualized information, but integrates that information from different governmental agencies.

Another type of e-service is the emerging possibility for patients to look at their medical records. This is definitely an individualized e-service. There must be a secure identification. The patient should only be able to read his own medical records and not anyone else's records. If it is only one clinic that is affording this possibility, then the service is separate. If this e-service only implies reading of fixed medical records, we rather call this an informative e-service and not a performative one, although it is selected information. This kind of e-service is thus separate, individualized and informative. If the e-service should include several clinics, then the e-service would be coordinated, individualized and informative.

An e-service for application of student financial aid involves a possibility to apply for such aid by filling a form. In this stage of the process there is no individualized treatment of the student. The agency receives an individual application but no individualized feedback is given in this type of e-service. This means that this e-service is performative (the student performs an application), separate (a service restricted to this agency) and standardized (a standard form is afforded). In later stages (succeeding e-service), there will be a shift to an individualized and secure service to the student.

An e-service for provisional driving licences incorporates all types of advanced services. It affords possibilities to apply for a permit for practice driving. This demands an individualized service with secure identification. The applicant must be able to perform certain communicative actions (applying for a permit). This e-service coordinates different services since several governmental agencies must

be consulted before an approval is made. This e-service is thus a most advanced e-service; it is at the same time performative, individualized and coordinated.

These examples show that e-service properties should rather be considered along these three separate dimensions. The different properties should not be mixed into one linear stage model. These dimensions should be kept separate when characterizing e-services.

5 CONCLUSIONS

We have in this paper investigated shortcomings of stage models for public e-services. There are many variants of such e-ladder models. It seems to be the prevailing way to look at public e-services. As such it should be scrutinized, since it has a very strong impact on planning, designing and assessing public e-services. We have identified several weaknesses in such models. The conceptualization into stages seems to be doubtful. If one considers the e-ladder as a descriptive model of how e-service features evolve, this view can rejected both on conceptual and empirical grounds as has been shown in this paper. E-service properties should not be seen as a one-dimensional stage model. We have in this paper converted the stage model into a three-dimensional diamond model. We have gone from a linear stage to three polarities. The most advanced stage (in the e-ladder model) does not always include all lower stages. An e-service should be characterized in a more proper way using the categories inherent in the diamond model. This model consists of a classification with twelve categories (figure 4) to be compared to the four categories in a standard e-ladder model. We claim that the e-diamond model (with the more categories) gives a more adequate and nuanced classification of e-service. By using the e-ladder model the risk to get a false characterization of an e-service is obvious.

The e-ladder may deceive policy makers to strive for higher levels on false grounds. Why should one try to implement an integrated, transactional and interactive service if the obvious need is an informative, general and separate service? The functionality afforded in an e-service should correspond to actual needs. Trying to do something more (faulty moving up the ladder) seems to be a way to waste tax money when making too advanced technical solutions.

A normative use of e-ladder models seems to be hazardous. Based on what has been said earlier in this paper we find e-ladder models to be an erroneous ground for benchmarking of e-services in national and international comparisons. E-ladder models should be abandoned also in policy-making and planning of new or revised e-services.

We have in this paper presented an alternative model: The e-diamond. Even if more research is needed we claim that this model seems to be a better alternative than the e-ladder. The e-diamond model can be used to position existing and planned e-services. It can be used for evaluating existing e-services. Such an evaluation should however always be made in relation to actual services needs.

Are there not more polarities to be used to characterize e-services? Are the three polarities identified through this analysis sufficient? The input to our analysis is the stage models presented and their different stage categories. Through this analysis we have generated some more categories besides a new structure (a diamond structure). We do not claim that the last word has been said about e-service categorizations. New categories may be found through conceptual and empirical analyses. The diamond model is open to incorporate new categories and polarities as opposite to the fixed structure of stage models. One possible polarity to add to the diamond model is the degree of user adaptability of e-services, i.e. adaptable vs fixated e-services.

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