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# Forward Value Creation and Digital Government: Solving the Cost-Benefit Paradox

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**Abstract.** While adoption of new technologies and supply of online services are in focus of measuring uptake of online services in maturity models, measurement of direct and indirect outcome and value creation for the internal and external end-users are only marginal addressed. Based on three vignettes from Norway, this paper argues that the importance of cost overrun is over estimated in the short run, while long-term benefits as well as indirect benefits are underestimated in public sector it-projects. We present a set of propositions for future government digitalization projects, bringing attention to the involvement of internal and external users and bringing focus to balancing short term and long term direct and indirect costs.

**Keywords:** eGovernment success; citizen centric; digital transformation; public values; public sector.

## 1 Introduction

This paper contributes to the conceptualization and measurement of eGovernment success. While eGovernment research have been rich on failures of eGovernment (references), there has been less attention to good practice and use of positive inquiries methods (references). Yet, at the practitioner-oriented conferences such as the Bled Conferences (reference) and the Norwegian NOKOBIT conferences, there has been a continuous interest and sharing of projects and approaches. In addition, a range of research activities supported and disseminated through for example the EU and national funding schemes such as the German Forschungsgemeinschaft, NSF, and Norwegian Research Council, have generated a massive pile of research. Despite the openness and intentions to share the findings from the projects, there has been a disjointed development in the academic eGovernment focused environment and the more practitioner focused.

The first European Conference on eGovernment was held in 2001 [1], the first International Conference on eGovernment was arranged in 2002 [2]. Both conferences had eGovernment success as important topics, and since then almost two decades of eGovernment research has addressed success of eGovernment applications. As societies and public values are not a constant, the criteria for success have changed over time.

The field of eGovernment is based on certain core ideas: Public sector transformation, digitalization, citizen-centric services and public value creation. The concept of public value has been discussed since the time of ancient Greece, but in modern times the current public value debate started with Mark Moore's book *Creating public value: Strategic management in government*. Moore defined government's role as that of creating public value, but what constitutes public value changes over time [3], hence the need for ongoing research into value creation in eGovernment.

In this paper, we present an overview of existing research on value creation and eGovernment success, and move on to propose a framework for eGovernment success, based on the literature. We present findings from three Norwegian cases that illustrate how the framework fits with current real-world projects, and discuss the implications of our findings for future research on eGovernment success.

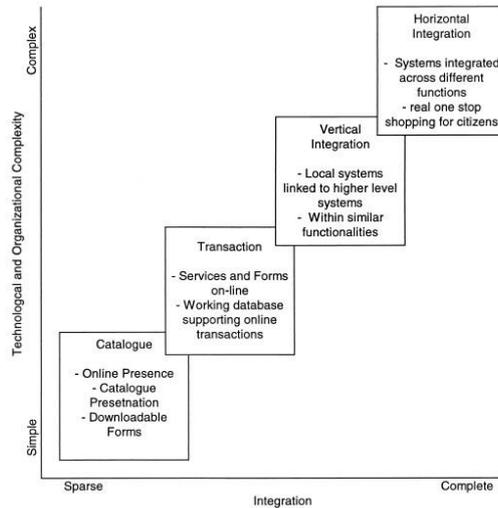
## **2 Prior research**

In this section, we present an overview of literature on success in eGovernment, and go on to discuss how the concepts of transformation, digitalization, citizen-centric services and public value creation influence our ideas about what constitutes success.

### **2.1 Measurement of success**

The measurement of success in eGovernment solutions have been addressed by many researchers. In the early years of eGovernment provision of services was seen as success in itself. Researchers looked for available services and used their existence to benchmark between countries, regions and municipalities

Other researchers measured maturity by addressing the system and data integration and the organizational transformation. For example, Layne and Lee coined a framework that included four different levels of maturity. The first level was cataloguing (presentation of information) online, e.g., static web pages. The second level contains interaction, where citizens can submit forms or comments. The third level addresses vertical integration where the front-end system (web application) was connected to back-office systems. The fourth level, horizontal integration, is reached when system communicates with other systems across organizational boundaries to create value for the user. The model was later enhanced by Andersen and Henriksen [4]. Their Public sector Process Rebuilding (PPR) model includes strategic ambitions of the use of ICT in government and focus on activities and citizen centrality.



**Fig. 1.** eGovernment Maturity Model.

Most benchmarks between countries used an approach of scoring the maturity of a number of services governments. This was done by Accenture, Brown University and United Nations.

Holzer and Kim [5] proposed the following indicators of eGovernment success:

- Information dissemination, means and methods
- Two-way communication, the nature of relationship
- Services that will be available to the citizen or any stakeholder
- Integration
- Political participation, to what extent the citizens will be involved in the political matters, and how it would affect it
- Security, how secure transactions will be
- Usability, how usable (easy to use) will the transactions be and if they are user friendly or not

Almarabeh and AbuAli [6] argued that two critical requirements are needed for eGovernment success: availability and accessibility.

Bouaziz and Chaabouni [7] emphasized eGovernment as a multidimensional concept and proposed a set of criteria to evaluate the success of eGovernment projects. Their research is based on semi-structured interviews with 51 team-members involved in eGovernment projects in Tunisian government agencies. Two categories are used: Product success and project management success

Product success includes adoption and use by customers, adoption and use by government agencies, satisfaction of stakeholders, site content usability of sites and systems, impacts of project, and achievement of project objectives.

The Project management success includes schedule, budget and technical features.

Roman [8] used a different set of dimensions to evaluate success in eGovernment: Security, functionality and transformation. Success is dependent on performance along all three dimensions.

Another way to measure success is to look at actual use, e.g., number of users, number of transactions. In some cases, it is appropriate to look at uptake as a percentage of a total, e.g. number of electronic submissions compared to the number of non-electronic submissions. Finally, success can be measured from user feedback, where the users report on importance, availability and accessibility.

## **2.2 Government objective: User-centric digital transformation**

The transformation of the public sector can be traced back to the new public management paradigm, which might be characterized a global mega trend in modernizing the public sector organizations since the introduction in the 1980's [9]. The idea behind new public management is to transform the public sector based on ideas from the private sector. A significant development is to see citizens as customers, not as clients. The new public management put emphasis on measuring user satisfaction of services and creating user-centric services [10].

Digitalization of the public sector aims to make more efficient services. Digitalization relieves employees from simple tasks, so they can focus on more complex tasks. For end-users, digital solutions are available 24 hours, 7 days a week. Digitalization also brings opportunities for more transparency. Information can be shared cost-effectively. The possible savings from self-service are high. The city of Copenhagen, Denmark estimated the cost of a physical visit by a citizen to Euro 20, the cost of a telephone call to Euro 10, and self-service through the Internet to Euro 0.5 [11]

In the white paper "Digital Agenda for Norway" [12], the government outlines its policy for a digital transformation of the public sector. One of the key objectives is to create a citizen-centric mindset in government. To the user (the citizen), public services should be presented as coordinated and complete. Many public services involve several agencies and levels of government, but with a user-centric mindset, this should not have any consequences for the user, as (s)he expects one single point of entry and one streamlined process. Information sharing is another key element of the policy, and literature finds that services not designed with a user-centric perspective often have a much lower adoption rate [13]. Citizen centric services implies that services are built around the citizen. The problem is that eGovernment services are not always seen to benefit the citizens. It is therefore crucial to include citizens in the development process in order to make better and more efficient services as seen from the user perspective.

Usability testing is essential in user-centric government [14]. However, in government projects, the stakeholders can be many and diverse and have interests that do not necessarily align. There can also be large differences between the objectives of citizens using the system and the government officials handling the case. This presents an additional challenge for user-centric government [15],

Despite this strong focus on user-centricity, eGovernment projects have often been focused around the service being delivered, and citizen needs have not been taken sufficiently into account [16].

### **2.3 Public value creation**

Public value creation is about creating value for the citizens. The value is measured by for example time saving, availability through difference proximities and devices, and accessibility quality of services (references). There are several competing definitions of what constitutes public value. For example, public value can be seen as a multi-dimensional construct, focusing on both outcomes, culture and processes. Typical concrete values could be better public services, increased accountability and trust in society and in government, or the long term solving of social problems and decreasing socio-economic divides [17]. However, others claim that in order to find what constitutes public value at any given time and in different contexts, you need to examine the deliberation between elected representatives, government officials, citizens, organizational and business stakeholders [18]. Hence, a public value perspective will change over time, and the measures we apply to examine success changes with them.

Empirical research on public values should take account of a broad range of stakeholders, but within and outside of government [19], and some even call for co-production of services, where citizens are included in creating the services they use [20]. This view aligns well with the current user-centric focus in eGovernment, and strengthens our argument that a public value perspective can be useful when measuring eGovernment success.

## **3 Research design**

The objective of this paper is to examine existing research on value creation in eGovernment and apply this to empirical data in order to create a framework for eGovernment success; to address the objective we have conducted three case studies of successful eGovernment projects in Norway, and compared the respondents' ideas on why the projects were successful with literature.

Our study is exploratory; an exploratory case study is a suitable method to address the "how" research questions and understand the phenomenon in its natural context. Our study is also interpretive, as the data collection was not guided by pre-assumptions from literature or theory, and the theory guided our analysis of the empirical findings [21].

We collected data for the case in August/September 2018. The collected data consists of white papers and reports from government and interviews with key personnel in the three cases. The authors have used the three services on several occasions, and

we have compared notes on our experiences, as well as informal interviews with colleagues and friends who are also users of the three services in order to verify our own experiences.

After data collection, we conducted our literature review of eGovernment success and public value and compared the cases with findings from literature. This allowed us to create the five propositions presented in section 5.

## **4 Three Vignettes from Norway**

### **4.1 Vehicle registration transfer**

The Norwegian Public Roads Administration's vehicle and license registry has been digital since 1980. As part of the government focus on digitalization of the public sector the system was scheduled for renewal in the 2010's. The project has been split into seven smaller projects and is scheduled to be complete in 2021. The original software, written in Cobol, has been updated and converted to Java and a service-oriented architecture, and new functionality is being added. The Autosys project is among the largest ICT projects in the Norwegian public sector, and the main driver is the Norwegian government's plan for digitalization. The project team has worked hard to show the benefits of digitalization in the Norwegian Public Roads Administration, and while we were not able to get any numbers, the respondent hinted that savings in terms of both cost and resources have been significant.

One deliverable of the project is the digitalization of a paper-based and manual process for vehicle ownership transfer. There are millions of vehicle sales and ownership transfers each year, involving citizens, car dealerships, and other public agencies such as police and customs. Previously, selling a car involved sending papers and signatures to the Public Roads Administration. This process was time-consuming and confusing for customers and costly for car dealerships and the local road administration offices handling the paperwork. A problem appeared when one of the parties for some reason did not submit the transfer registration form.

The new, digital solution has simplified the process by creating a guided step-by-step process that is completed fully online. The seller and buyer of a vehicle both have to sign in using their electronic ID and confirm transfer of ownership. Once this is done, the process is over. For most cases the process is fully automatic, saving a lot of time and resources.

From a user-centric perspective, the case is interesting for several reasons. The respondent from the Norwegian Public Roads Administration points out that self-service is an ideal for public sector digitalization projects, and the back-end interoperability between systems saves a lot of work for case handlers, sellers and buyers alike. While the underlying Autosys system is basically the same as it was in 1980, the process of transferring ownership has been simplified. This simplification of processes is central to many of the ongoing digitalization projects in Norway, as it is more cost-efficient.

The respondent emphasizes that the most important success criteria of the project has been project management, systems development methodology and a value-based management perspective. Using Prince 2, agile development methods and standardized procurement contracts has allowed the project to run smoothly despite the many stakeholders involved. Private sector development and consultancy companies, various offices of the Public Roads Administration and other government agencies such as police and customs.

From a value-based management perspective, user-involvement has been stressed as one important value. Users have been identified as both internal and external. Internal users include case handlers, first line responders in the regional offices, as well as offices from more specialized areas such as dangerous goods road transport. External users – employees and managers from car dealerships as well as private citizens-as-car-buyers, have been involved in several iterations of usability testing. In total, the respondent claims that between 100 and 150 people have been involved in a user-centric development process.

The change of ownership system has also been part of the Norwegian plain language project, another part of the overall digitalization plan for Norway [23]. Using plain language in the change of ownership process has significantly reduced the number of calls and e-mails to local offices, as users find the process and language of the new system easier to understand.

Finally, in terms of user numbers and user evaluation, the respondent would not share numbers and figures, as these are found only in reports used internally in the Autosys project and not available to the public. Instead, he talked about challenges related to the Norwegian “digital first choice” policy, where users are encouraged but not required to use digital solutions. This has led to many users preferring the old manual processes, which in turn lessens the potential benefits of the system. This is confirmed by a study of digital mail boxes comparing Sweden, Denmark and Norway’s different approaches to digitalization. In Denmark, citizens are required to use digital services unless they have health related reasons for not doing so. In Norway, citizens can opt out with no explanation, while in Sweden they must opt in. User numbers show that Denmark’s approach is the most effective when it comes to benefits realization and user numbers, but also shows that this approach leads to more resistance and less satisfied users [24]. From a user-centric perspective, this could indicate that “first choice” is a better approach than “no choice”, as practiced in Denmark.

## **4.2 Electronic prescriptions**

Before electronic prescriptions were established, the medical doctor issued a prescription on paper. The patient had to deliver this at the pharmacy and wait for the preparation of the medication. Errors happened because the prescription was in hand-writing, and sometimes difficult to decode. There was also some misuse, since patients visited several pharmacies to get multiple doses.

The concept of electronic prescriptions was raised in 1997 by a government appointed committee to examine the general conditions for sale of medicine. The com-

mittee pointed out that electronic prescriptions would make prescriptions safer by making the medical doctor aware of other medicines used by the patient, of possible duplicate prescriptions, and maximum and minimum dosages. The medical doctor could also get information about similar products with a lower price. [25]

Development of electronic prescriptions started in 2004 with an allocation of NOK 40 million in the Government's Fiscal Budget. The Ministry of Health and Care argued that electronic prescriptions would lead to faster and more secure transfer of prescriptions between the medical doctor and the pharmacy. Electronic prescriptions would also make control of prescriptions simpler, more effective and less resource-consuming. [26].

A pilot was launched in May 2008 in the municipality Stor-Elvdal. After four months, the municipality withdrew from the pilot. Municipal officials blamed the system as slow, faulty and incomplete. The company developing the system claimed that the system became more complex than originally anticipated. [27]

The plan was to implement electronic prescriptions on national level before 2010.

The system for electronic prescriptions started trials in 2010, and first release on national level happened in June 2011. Most general practitioners were connected during 2013, and since then hospitals and dentists have been added to the user base.

The new system connects the medical doctor to a national system for prescriptions. The patient can then go to any pharmacy to pick up the medication. The system provides better quality, since the errors from hand-writing were removed. The system also provides better protection against misuse.

Citizens can access a history of own prescriptions through a personalized web page using one of several authentication methods.

In a press release from 2015, the minister of health and care, Mr. Bent Høie made the following statement: *"To create a health service where the patient is in the center, good ICT solutions must be present"*.

### 4.3 Tax return statement

One of the most popular services is the electronic tax return statements. When electronic tax return statements were introduced, citizens could fill in the necessary data and submit it to the tax authorities. The electronic tax return statement won some prizes for e-government solutions about ten years ago. But the development has continued, and the tax authorities now collect almost all information needed. It is no longer necessary to sign the tax return statement (Introduced in 2008). If no modifications are made, the tax return statement is regarded approved by silent consent. The tax authorities have embraced user-centric development, and "user needs" is the most used tag in their own development blog<sup>1</sup>. For each iteration of the tax return service, users are invited to test and provide feedback on the solution. The latest version, introduced in 2019, had more than 400 people volunteer to beta-test the solution, and their input was used when finalizing the version.

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<sup>1</sup> Beta.skatteetaten.no (Norwegian language only)

**Table 1. TAX RETURN STATEMENTS**

	Internet	SMS	Phone	Total
2003	544.000	191.000	378.000	1.113.000
2004	675.346	219.237	294.442	1.189.025
2005	1.255.536	276.006	269.542	1.801.084
2006	1.400.031	320.459	217.358	1.937.848
	1.471.739	341.816	226.218	2.093.773
2007	1.538.025	365.454	194.642	2.098.121
<i>From 2008 signing was no longer mandatory (silent consent).</i>				
2008	962.743	112.077	55.155	1.131.076
2009	870.000	-	-	870.000
2010	868.514	-	-	868.514
2011	856.396	-	-	856.396
2012	939.910	-	-	939.910
2013	870.270	-	-	870.270
2014	1.110.122	-	-	1.110.122
2015	1.177.822	-	-	1.177.822
2016	1.164.881	-	-	1.164.881
2017	1.230.364	-	-	1.230.364

Table 2 shows the increased use of the tax return statement solution.

Previous to the electronic submission process, the submission of tax return statements involved a lot of work for the citizens. Citizens had to collect all the information from various sources, check the completeness of the information and submit a paper-based form with attachments. The electronic solution collects all the information from employers, banks, the national register of properties, and other sources. The citizens just have to check the information and fill in missing data. This can be tax deductions for commuters, properties in foreign countries and other data not available to the tax authorities. What used to be hours of work is now reduced dramatically.

The uptake of the electronic solution may be a clear indicator of success. The tax authorities receive almost no tax return statements on paper.

## **5 Five propositions on how to forward the value creation for internal and external stakeholders**

The three vignettes from Norway illustrate well how different projects unfold in the public sector. While there are many IT project and program management books that provide guidelines and check-box tools on how to manage strategic, tactical, and operational aspect of public sector IT-projects, we will in this section formulate five propositions about how to bring the value creation forward when planning, developing, and

running IT-projects in the public sector. Thus, our propositions are extensions to the body of IT project and program literature. Also, the propositions adds the conceptualization of maturity of digitalization of government by bringing attention to the involvement of internal and external users and bringing focus to balancing short term and long term direct and indirect costs. We have formulated five propositions aiming for developing a research agenda to be explored by the research community and practice:

**Proposition 1: Involvement and inclusion of external users in the early phases of project scoping and visions for the IT project minimize the risk of projects benefiting only the internal users**

This is perhaps the most visible factor of the three vignettes. All three are concerned with user-centric development and includes stakeholders in various phases of the development process. Norwegian government agencies are cooperating on a common set of principles for user-centric service design, where user-involvement is central. Further, our findings indicate that plain language is an important part of user involvement. All three examples report that much work has gone into creating a language that end-users find easy to understand.

**Proposition 2: Factoring in long term benefits will bring attention to the motivation why the IT projects is developed by the public sector**

Governments are under pressure to become more cost-effective and efficient. This can sometimes be translated into a strong focus on short-term project costs, as the media often covers budget overruns and project issues. As our three examples show, benefits often appear over time. This brings us to our next proposition:

**Proposition 3: Having less focus on short term costs of IT projects, will reduce IT project overhead costs**

There is often a gap between implementation and realization of public value and economic benefits. For example, the public roads administration started their digitalization process in the 1990's, and had to live through several failures before the current project organization found its form. In the short term, it would have been easier to retire the entire project. However, over time the project matured and started delivering public value. E-prescriptions were also criticized for being over budget and time, but is now regarded to be a huge success.

**Proposition 4: Bringing value to the end-users needs to be in focus when justifying and evaluating the IT project**

In government projects, literature shows that end-users (stakeholders) have different and sometimes competing needs. In our three examples, project management has attempted to balance differing interests and needs, while simultaneously having a strong focus on developing value objectives and realizing these. The defined value objectives vary between projects, but is often a mix of economic (cost savings for both citizens/organizations and government) and citizen-centric (ease of use, less red tape) values.

**Proposition 5: In general, projects need to have a scope and output that can be evaluated and when possible shared with other parts of government.**

Having a coordinating role in government can help government organizations learn from each other's mistakes, and contributes to an increasing level of professionalism in IT projects. In Norway, the directorate for public administration and ICT (DIFI), the language council and others have a coordinating role, inviting managers from different agencies to meet and learn from each other. Over time this leads to government becoming more competent in managing IT projects. Further, the municipal and regional coordinating entity KS has recently launched a platform for sharing services, projects and best practices across regional and municipal governments. Finally, our three examples show the importance of clear objectives and evaluation criteria, that also measure success over time.

## 6 Conclusions

While adoption of new technologies and supply of online services are in focus of measuring uptake of online services in maturity models, measurement of direct and indirect outcome and value creation for the internal and external end-users are only marginally addressed. Based on three examples from Norway, this paper highlights that the importance of cost overrun is over estimated in the short run, while long-term benefits as well as indirect benefits are underestimated in public sector it-projects.

This study examines three successful applications of eGovernment in Norway. All three services have been driven by the intent of the government to provide citizen centric services by use of information and communications technology, as well as traditional objectives related to efficiency and effectiveness. All respondents confirm that the user experience has been important for the projects, and data suggests that projects need to handle the tension between long-term benefits and short-term costs, public value as well as evaluation and sharing of results. Our paper presents five propositions, which extends IT and program literature by emphasizing maturity over time as an essential factor. The propositions form the basis of a research agenda for further research in the area of public value creation in government IT projects.

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