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SIX KEY LESSONS FOR E-GOVERNMENT PROJECTS

Karin Axelsson¹, Ulf Melin²

Abstract. In this paper we analyze a public e-service development project from its initiation to its end and reflect upon the process as well as its results. The purpose of the paper is to develop knowledge about how e-government projects should be managed and performed in order to be successful. We do this by identifying and analyzing important decisions made and external factors that occurred during the project and discussing their consequences. The findings are presented as six key lessons for e-government projects. The novel knowledge contribution is that the lessons combine aspects from established CSFs of IT projects with e-government-focused issues. Together these six lessons can be more useful in e-government projects than previous sets of general CSFs for IT projects.

1. Introduction

In this paper our intention is to analyze an e-government development project from its initiation to its end and reflect upon the process as well as its results. We have conducted a longitudinal case study, where we for three years followed, studied, and partially participated in a Swedish e-government project. The purpose of the paper is to develop knowledge about how e-government projects should be managed and performed in order to be successful. We do this by identifying and analyzing important decisions made and external factors that occurred during the project and discussing their consequences. The findings are presented as six key lessons for e-government projects. The knowledge contributions are both a reflective analysis of an e-government development project and normative statements about how to conduct successful e-government projects.

Many reviews of e-government research criticize the field as being purely descriptive and over-optimistic towards the positive effects of information technology (IT) within public administration [8] and towards citizens. It is our intention to balance this view by analyzing the studied project's, in some aspects, less successful process and outcome in a reflective way and formulate lessons based on our findings. By doing this we do not only provide a case description but use this empirical material to inductively learn from one case and make it possible to transfer this knowledge to other future cases. After generating the lessons based on the empirical material we put them into the context of previous research results in the area in order to validate them.

The paper has the following disposition; after this introduction failure and success in e-government projects are discussed. In the next section, the research design is described. Thereafter, the e-government project's stakeholders and background as well as the project's motivation are discussed. In this section the project process is also reported. Based on this

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empirical case six key lessons are identified and discussed in the following section. The inductively generated lessons are then related to theory. In the concluding section of the paper we summarize the contributions.

2. Failure and Success in E-government Projects

There are many studies reporting failures in e-government projects [7]. The literature in the area of e-government development and e-government projects, as well as information systems (IS) development projects in general, reports on several sets of success factors. For example, Gil-García and Pardo [6] as well as Ho and Pardo [9] have made broad reviews of e-government projects' critical success factors (CSFs). CSFs identified in their studies are, e.g., top management commitment, linkage to business, technical alignment, knowledgeable personnel, and user involvement [9:2]. CSF, independently of source and context, tend to be of this kind.

If we look at the CSFs reported from IS development projects in general we find factors like the ones mentioned by Ho and Pardo [9], and even reports of IS project failures, which the CSFs tend to be the inverse of. In Reel [14] ten signs of project failure are reported. Project managers do not understand user's needs, the project scope is ill-defined, project changes are managed poorly, the chosen IT changes, business needs changes, deadlines are unrealistic, users are resistant, sponsorship is lost, the project lacks people with suitable skills, and managers ignore best practices and previous lessons learned [14:19].

Critic against e-government as being weak on reflective studies resulting in knowledge useful for either practical use or further research is put forth by Heeks and Bailur [8]. They are very explicit in their criticism of the state of e-government research when they argue that it "*draws mainly from a weak or confused positivism and is dominated by over-optimistic, a-theoretical work that has done little to accumulate either knowledge or practical guidance for e-government.*" [8:243]. Based on this critic we argue that empirical e-government research cannot only, or always, end in a description of the studied case, instead findings from a case must be possible to transfer to other future cases. In order for such knowledge transfer to occur the findings need to be structured in an appropriate way and validated in, or challenged by, previous theory.

We propose an approach where findings from a studied case are formulated as key lessons, grounded in previous studies. A similar approach is used by Irani et al. [10] who formulate statements from a multiple case study of e-government evaluation in terms of normative lessons to be learned in order to improve practice. They argue that e-government evaluation is an under-developed area. From their empirical findings they criticize how e-government development initiatives are evaluated concerning social factors, evaluation, adoption, ownership, prioritization sponsorship, and responsibility [10]. Related to this critic it is possible to view our study of the e-government development project, discussed in this paper, as a kind of summative evaluation of the entire project process.

We state that retrospective, reflective evaluations of projects' pros and cons, both concerning process and outcome, are important to perform in order to learn for the next project. Learning from the past and from the experiences of other e-government development initiatives is essential for improving the development of public e-services [11] as well as the research body of knowledge. Simultaneously, e-government builds on technology innovations that imply

new challenges for governments [11]. In order to balance between earlier experiences and future innovations, reflective case studies are important.

3. Research Design

Our study was partly conducted as an action research (AR) project with the dual purpose of both developing and evaluating public e-services. AR is a qualitative research approach that is often used within the IS discipline [3]. The intention of AR is to solve practical problems and at the same time develop scientific knowledge. Our roles as researchers have differed during the various phases of the projects. We have partially intervened in project activities and fulfilled certain assignments such as business modeling and evaluations of different kinds, but we have also been analytical observers. An important theme in AR is the ambition to develop a broad view of studied social systems. Social systems are usually in transition or change when studied and intervened. The intervention means that researchers observe and participate in the studied phenomena [2]. The degree of researcher participation and roles can differ between phases in an AR project and be dependent upon type of action taken [1].

Our empirical findings were generated both during our participation in project activities, i.e., through observations and interventions, and during interviews with different stakeholders. We have performed in total 15 interviews with project members, case officers, decision makers at the agencies, and external IT consultants. We have also studied project documentation, such as requirements specifications, project models, process models, etc. and documents related to the progress of the project (time tables, milestones, leverables, etc.). The empirical material mainly consists of qualitative data and it has been analyzed using an interpretive, qualitative approach [15].

An important characteristic of our AR approach has been that we have altered between the roles of 1) action-taker and 2) reflective observer and critical reviewer. These two roles might seem to be each others' opposites, but we argue that researchers are able to alter between these two states if only the research design is carefully made. We have, e.g., evaluated and proposed changes in system specifications, but the agency project leader has then been responsible for receiving our results and using them in the next phase of the project. By doing so it has been possible for us not only to contribute practically to the project, but also to reflect upon and question events and results. As researcher we have also been aware of the two different roles as well as their special preconditions and expectations. We have also been able to organize so that we had the possibility to distance ourselves from the development project and the "action part" of the project and focus on reflective analysis and scientific publishing during several project phases.

Of course this forces us to explicitly question the responsibility of researchers. What responsibility lies on researchers versus practitioners for success and failure in this kind of projects? In the studied project we have explicitly agreed upon different actors' responsibilities; cf. researcher-client agreements, in Canonical AR [4]. The researchers have altered between being active participants and reflective observers (evaluators), but we have never made any formal project decisions or owned the e-government development problem-solving in any sense. Instead, we have contributed with scientific knowledge, methods, external views and critical examination in different phases of the project. Another aspect of this is that the development project was planned and staffed prior to the research started. Thus, some critical project decisions had already been made. The AR performed in this study can therefore not be classified as full, but partially AR, as mentioned above.

We report from a single case study in this paper. Arguments can be raised that empirical findings from several cases would strengthen our conclusions. We have chosen a single case approach since this longitudinal study has provided us with very rich data material of how an e-government project should (or should not) be successfully accomplished.

4. The E-Government Development Project

The studied development project concerned inter-organizational (IO) e-service development in public sector in Sweden. This project aimed to develop one-stop government e-services for driving license matters. As in many e-government initiatives, the purpose of this development project was originally formulated as a dual goal of increasing citizen benefits and agency internal efficiency (e.g., concerning driving license errands in the internal processes of the agencies). An important aim was that the results from the development project should have a distinct service focus of an IO nature, in order to decrease the unclear responsibility division between authorities that citizens might experience and suffer from.

4.1 Stakeholders and Background to the Project

Three Swedish agencies were involved in the project; Sweden's County Administrations (SCoA), which organizes the 21 county administrative boards of Sweden, the County Administrative Board of Stockholm and the Swedish Road Administration (SRoA). The overall background to the project is that a person in Sweden who wants to get a driving license, first has to apply for a provisional driving license from the regional CoA. The provisional driving license is approved if the applicant is judged by the regional CoA to be able to drive a vehicle in a safe way. The permit is, thus, an important aspect of traffic security. The permit application was, prior to this e-service development project, a paper-based form that was filled in, signed and sent by mail to the regional CoA. The application had to be complemented with a health declaration, a certificate of good eyesight, and maybe also an application that, e.g., a parent will be allowed to serve as a private instructor. These documents were received and reviewed by a case officer at the CoA. The case officer also checked if the applicant had been sentenced for any crimes. This information was registered in a database operated by the police which the case officer had access to through one of SRoA's IO IT systems. When the provisional driving license had been granted, the CoA reported this to SRoA through this IT system. When the applicant has completed the driving test and the theoretical test successfully he or she receives the permanent driving license from the SRoA.

4.2 Project Motivation

The mix of different responsibilities and contacts in the driving licence life cycle, described in the prior section, was seen as an appropriate set of incentives for developing an e-service. The development project aimed at implementing an e-service that makes an automated decision in "green cases" (i.e., application cases that do not call for any extensive handling process before being approved) and supports case officers handling such cases. By achieving this, the agency should in the long run try to save and reallocate resources from handling "green cases" to more complex errands.

An e-service like this also provided an opportunity to standardize the application handling processes in the nation and the 21 county administration boards. The agencies had high expectations concerning the quality of data provided by citizens. The use of an e-service when filling in the driving licence application form makes it possible to automatically check data

quality and completeness. Another advantage with an e-service is that the underlying IT system directs the citizen to the appropriate CoA, instead of having citizens wondering which board that is the right one for them.

Just prior to the project initiation the SCoA had got a special commission from the Swedish Government to develop four public e-services. SCoA was free to decide within which areas these four e-services should be developed. The development project we studied was initiated as a direct response to this commission together with three other e-service projects. The process of applying for a provisional driving license was selected by SCoA because this process was apprehended as rather simple to automate. Another reason for choosing this process was the mix of involved agencies, discussed above, which might confuse citizens. There was, however, no systematic assessment of citizens' demands and public usefulness regarding this e-service before starting the project. The government's commission, together with the notion of this area as an easy one to transform into e-government, were the two main incentives for starting the project. No explicit objectives were initially formulated for the project, except that the deadline in the government's commission should be met. The commission stipulated that four e-services should be developed within one year. This time limit was, however, heavily overdrawn before the development project was completed.

4.3 The Project Process

The e-service development initiative was established prior to the present case study, as mentioned above. The development project initially started without any explicit development strategy, e.g., for user participation. The citizen perspective, and the potential of citizen involvement, seemed to be more or less forgotten in the planned project activities. Instead, the development of the e-service for driving license matters started in a group of internal representatives from the SCoA and SRoA together with external IT consultants. The outcome from the development project was not at first anchored in any citizen requirements or explicitly expressed problem outside the government agencies. The development group was mainly focused on how the e-services would influence the internal procedures and routines (e.g., document handling processes) at the agencies. The external IT consultants were left with rather free choices regarding critical issues on how the e-services should be developed and designed. User requirements were mostly "guessed" (supposed) by the agency officers according to their prior experiences from direct citizen contacts.

When the researchers started to follow and participate in the development project, the researchers posed questions about the citizen perspective, citizen involvement, and how the user requirements were supposed to be generated during the e-service development process. As a way of handling the situation, and in order to facilitate citizen participation in the development process, we proposed that focus group meetings should be arranged in order to discuss how young people think about the e-service under development. Information gathered from these discussions was meant to complement the information and experiences from the agency officers in the project, in order to consider if their assumptions about the citizens requirements were valid or not.

As results of the lack of problem and user requirements understanding, the development team overestimated the citizen need for this e-service. Applying for a provisional driving license is an action that is usually only done by citizens once in a lifetime (or at least very few times). Reducing the lead-time of this process from a few days to a minute was not apprehended as crucial by citizens; i.e., it was not anchored in any experienced problem or need. During the development project it also became apparent that the identification method that users of the e-

service were supposed to use (an e-ID) was not easily accessible for people under the age of 18 years, since the majority of the e-ID providers (e.g., banks) do not accept applicants under the age of 18. Since many of the presumptive users were teenagers between 16 and 18 years old, this appeared to be a problem that no one really had foreseen. Low sense of urgency towards the e-service and obstacles to use it were two factors that together negatively influenced the usefulness of the e-service.

Another problematic and challenging insight, several months after the project started, was that the change from using a paper-based form to an electronic form when applying for a provisional driving license demanded changes in legal regulations. In the existing regulation text the form was mentioned as being paper-based. The project had to apply for a change of this law text concerning driving license issues at the Swedish Ministry of Finance. This delayed the project, created a tension between project members and created intense need for lawyer competence in the project.

As mentioned above the provisional driving license application was selected by SCoA because it was seen as easy to automate. The project team started to develop the public e-service, which was designed as a rather simple web interface following more or less the same logic as the paper-based form. This part of the development was not very complex, but the application information that should be submitted to the agency via the e-service had to be received by the case officers. Thus, a new back-office IT system (on application and infrastructure level) had to be developed to handle the electronic applications. This part of the project turned out to be much more complicated than anticipated. The internal processes had to be both reconstructed and changed which delayed the project seriously. The complexity of these process modelling activities was underestimated by the project team.

Yet another complexity, that the development team could not have foreseen, was that a new regulation at that time stipulated that parents (or other adults), who wish to serve as private driving instructors, had to go through an education program before applying to be instructors. This new demand implied that an e-service also had to handle these educational certificates which made the process more complicated than expected. This e-service has, however, been quite a success regarding usage frequency compared to the provisional driving license application

Obviously, the development project turned out to be both more complex and more extensive than it was originally planned to be. The complexity regards both the IT dimension and the business process dimension of the change process. This could of course had been handled by distinct and competent project management and reallocated resources. Unfortunately, the project team was staffed in an ad hoc manner. The project members were, to a large extent, those who had time left in their planning rather than those who had an appropriate competence for the assignment. The project leader had no prior experience of leading this kind of complex e-government projects. Instead, external consultants were hired for both operative and managerial tasks. This resulted in a situation where external consultants, in the roles of IT designers, process designers and project leader support, made many critical design decisions more or less on their own, due to lack of response from the organization. This implied an expensive development situation where much knowledge stayed outside the organization.

5. Six Key Lessons to be Learned

Below we present six key lessons to be learned based on the development project studied and presented above. The six lessons concern: (1) project incentive, (2) project scope, (3) project planning and staffing, (4) legal preconditions for the e-service, (5) citizen-centered requirements analysis, and (6) citizen identification and security.

(1) Project Incentive: Prior to the e-government project, SCoA got a special commission from the Swedish Government to develop four public e-services within their areas of responsibility. The driving license area was selected as one of these four e-service incentives. Unfortunately, this decision was not based on any explicit problem identification or assessment of citizens' needs. Instead, the main incentive for selecting this area was that it was apprehended as easy to develop an e-service within, as reported earlier. Thus, the strict time schedule for the four development projects were likely to be met. Obviously, there were both internal and external problems concerning driving licenses, but these were not known and analyzed before the decision was made. This is an issue of imbalance between supply and demand for the e-service; the lesson learned is: *An e-government project should be initiated based on someone's explicit need for the e-service – there should be a problem that the e-service would solve or a situation to facilitate.*

(2) Project Scope: As predicted, the public e-service turned out to be rather uncomplicated to develop. Not at least because the development team decided to translate most parts of the paper-based form into the electronic medium, i.e., the e-service was rather close to the old application form used before. What was totally underestimated, on the other hand, was the complexity of the internal IT system, and the platform, that had to be developed in order to handle incoming electronic applications. In order to develop this IT system the internal and, to some extent, the IO processes had to be changed. This process change was much more time-consuming and complex than estimated. An external, complicating factor outside the control of SCoA was the new Swedish law that private instructors had to accomplish an education program before being approved. The internal IT system, thus, had to handle this data as well. The lesson learned is: *The e-service in itself cannot be the only scope of the project; the complexity of internal and IO process changes and its context must also be understood.*

(3) Project Planning and Staffing: The development project shows several examples of too low competence in project management. There are no simple explanations for this, but rather several interlinked aspects. First of all, the project maturity is low in SCoA when it comes to this kind of e-service development projects. The organization is mostly dependent on external competence in this kind of projects since there is very little in-house experience of IT development in general. There is also a culture of managing projects in a rather ad hoc way, without much support from project models, etc. Altogether this resulted in a situation where the project was not correctly delimited. Instead, the aim was to embrace every issue without dividing anything in modules. This resulted in a very complex multi-project setting where the project had to adapt to standardization efforts and platform choices made outside the project. This complex situation could have been handled by a more experienced and competent project leader and team. Unfortunately, the project leader lacked previous experience in this kind of projects, which created a severe dependence on external IT and management consultants. Also some of the project team members were inexperienced in e-service development (and use) and obviously not the best suited persons to participate in the project. The lesson learned is: *An e-government development project should be properly planned and staffed with persons with an appropriate competence.*

(4) Legal Preconditions for the E-service: When the development project started no analysis of possibly needed legal changes due to the e-service was performed. It was first after several months it became apparent that the e-service was not in coherence with the formulation of existing Swedish law. A proposal of changes in the formulation was then submitted to the Ministry of Finance. Even though these changes were not provocative in any sense, but only an adaptation to the new technology, it took several months to get this proposal approved. During this time the project could not continue as supposed and this was a major reason for the overdrawn deadline in the end of the project. The lesson learned is: *Analysis of legal preconditions for the e-service should be done in the very beginning of the e-government development project.*

(5) Citizen-centered Requirements Analysis: Starting to develop a public e-service directed towards citizens, without asking what the citizens need and if and how the planned e-service will meet this need seems to be the most critical mistake done in the studied case. The project was initiated with weak problem understanding and the requirements identified were found in an unsystematic way; mostly being guessed by the project team members based on their prior experiences of citizen contacts. Even though this problem was partly solved during the project, by performing citizen-centered focus groups regarding the e-service under development, it was a critical mistake to start the project without knowing the citizens' needs and requirements. Related to the vague (or even absent) problem understanding, SCoA's expectations on the project and its outcomes were not fulfilled. Besides underestimating the complexity in the internal processes, the amount of so called green cases that should be handled in an automated way by the e-service, was overestimated. The reason for this was that when automating the process the grounds for defining a case as green had to be agreed upon in all 21 SCoAs. This demanded compromises which ended in a decreased amount of cases that felt into this green category. Since the project team did not gather any understanding of the intended users' need for this e-service, they also overestimated the importance of getting information about the approval or rejection of the application in a minute instead of in three days. The learned lesson is: *E-service development projects should be based on a thorough understanding of citizens' needs and requirements.*

(6) Citizen Identification and Security: The e-service for provisional driving license applications demanded a secure identification technique. The solution chosen for this was e-ID which is offered by all major banks to their customers. This is a common security solution for Swedish e-services. The project team encountered an unexpected problem during the project as they realized that there are few possibilities to get an e-ID for persons under the age of 18. Problems with convincing people to acquire an e-ID are often discussed in e-service projects, but in this project the problems became more apparent as young persons are a major target and user group of the e-service. The lesson learned is: *The security and identification solutions chosen should be carefully examined, not only in general terms but also in relation to the e-service's specific target groups.*

6. Identified Lessons Related to Previous Studies

In order to put the lessons inductively identified and presented above in a context of previous studies, we have looked into the literature of success factors. If we compare the CSFs identified by Ho and Pardo [9] with the lessons formulated above, we can see that the development project studied shows the importance of business and technical alignment (lessons 2 and 3). The issue of knowledgeable staff is also present in the third lesson above. User involvement, as an important lesson and factor is also explicit in lessons 5 and 6.

We can identify several lessons in the present development project in Reel's [14] review of CSFs. User needs represented in lessons 5 and 6 are obvious, as well as the scope, definition and the complexity embedded in the project (lessons 2 and 3). The underestimation of business changes is also present in lessons 1, 2 and 5. If we look at the staffing of the project we have also identified the lack of people with appropriate skills and competences (lessons 3 and 4). We can also identify the ignorance of best practices and previous lessons learned, e.g., identified by the researchers and the consultants (lessons 1, 3 and 4). The issue of sponsorship and top management attention is however not a failure in the studied project. Sponsorship and management attention has been present. The overall conclusion is rather straight forward though; the studied development project shows several signs of project failure as identified by Reel [14].

The way the project was initiated (being selected as an easy way to fulfill the government commission) can be classified as "*identification of an opportunity which could be seized*" [7:162]. The e-government project was initiated as a direct response to this commission (lesson 1). The opposite of seizing an opportunity is by Heeks [7:162] defined as "*a problem that needs to be solved*"; i.e., an identified problem with internal and external sources. Kubicek and Hagen [12] have also identified challenges in the e-government area. They present six key areas of barriers to be overcome for fewer delays, failures and obstacles in e-government development. The first key area is summarized in lack of organizational cooperation, the second key area is missing legal regulations, and the third key area is the necessary area of pre-conditions in regard to IT and fourth in regard to human factors. The last barriers are lack of appropriate funding and political support. The area of barriers we will focus on here is the area of missing legal regulations. Most other areas have been covered by the issues reported by other scholars above. Missing legal regulations were obvious in the present development project (lesson 4) that severely affected the progress and climate in the project. Dawes and Pardo [5] also report that restrictive laws and regulations must be taken into account when developing e-government.

If we relate the issue of citizen identification and security (lesson 6) to Gil-García and Pardo's [6] study, they report that challenges to e-government initiatives are cross-disciplinary and that the issue of information and data, especially usability and security issues, is important and should not be underestimated. Kunstelj and Vintar [13] argue that many e-government initiatives so far have had the objective to quickly develop public e-services for citizens – what they call "*quick fix, quick win solutions*" [13:133]. Due to this strive for speed and easiness the re-engineering of back-office processes often have been neglected. In Kunstelj's and Vintar's critical study of progress in e-government development they find that a holistic perspective is needed, encompassing both integrated e-services for life events and a strategic view of IO public administration back-office processes [13]. We identify a similar need for holistic approaches in our case, paying attention to both the needs of different citizen stakeholders (lesson 5) and taking changes in back-office processes into account (lesson 2).

7. Conclusions

In this paper we have generated six key lessons from analyzing an e-government development project from its beginning to the end. The lessons are: 1) Project incentive: An e-government project should be initiated based on someone's explicit need for the e-service – there should be a problem that the e-service would solve or a situation to facilitate. 2) Project scope: The e-service in itself cannot be the only scope of the project; the complexity of internal and IO process changes and its context must also be understood. 3) Project planning and staffing: An e-

government development project should be properly planned and staffed with persons with an appropriate competence. 4) Legal preconditions for the e-service: Analysis of legal preconditions for the e-service should be done in the very beginning of the e-government development project. 5) Citizen-centered requirements analysis: E-service development projects should be based on a thorough understanding of citizens' needs and requirements. 6) Citizen identification and security: The security and identification solutions chosen should be carefully examined, not only in general terms but also in relation to the e-service's specific target groups.

The first three lessons above can be viewed as lessons valid in a general IS (or e-service) development domain while the last three lessons are specific to the e-government field. The novel knowledge contribution in this paper is that the lessons combine aspects from established CSFs of IT projects with e-government-focused issues. Together the six lessons generated in this paper can be more useful in e-government projects than previous sets of general CSFs. Similarities between these inductively generated lessons and results from other studies have been identified and discussed above. This validation makes us trust that this longitudinal case study has resulted in knowledge that should be plausible to transfer to other, future, projects. We plan to perform further studies where these normative statements are used as guidance in order to further validate their sustainability. We also plan to relate the results more thoroughly to general project management experiences from outside the e-government area.

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