KEY SUCCESS FACTORS IN NATIONAL IT INFRASTRUCTURE PROJECTS: A STUDY OF A NATIONWIDE E-BUSINESS INITIATIVE

Rebekka Helga Aðalsteinsdóttir

Thesis of 12 ECTS credits
Master of Project Management (MPM)

April 2015

KEY SUCCESS FACTORS IN NATIONAL IT INFRASTRUCTURE PROJECTS: A STUDY OF A NATIONWIDE E-BUSINESS INITIATIVE

Rebekka Helga Aðalsteinsdóttir

Thesis of 12 ECTS credits submitted to the School of Science and Engineering
at Reykjavík University in partial fulfillment
of the requirements for the degree of
Master of Project Management

April 2015

Supervisor:

Þór Hauksson

KEY SUCCESS FACTORS IN NATIONAL IT INFRASTRUCTURE PROJECTS: A STUDY OF A NATIONWIDE E-BUSINESS INITIATIVE

Rebekka Helga Aðalsteinsdóttir

12 ECTS thesis submitted to the School of Science and Engineering
at Reykjavík University in partial fulfillment
of the requirements for the degree of
Master of Project Management (MPM).

April 2015

Student:

_____

Rebekka Helga Aðalsteinsdóttir

Supervisor(s):

_____

Þór Hauksson

Department:

_____

KEY SUCCESS FACTORS IN NATIONAL IT INFRASTRUCTURE PROJECTS: A CASE STUDY OF A NATIONWIDE E-BUSINESS INITIATIVE

Rebekka Helga Aðalsteinsdóttir[1]

ABSTRACT

The role of information technology has become a key driver in cost efficiency measures. In order to achieve that goal however, it is vital that systems are kept simple and interoperability is king. That is the reason why some countries have begun introducing and even mandating national IT standards. This paper focuses on the implementation of such standards for e-business in the Nordic countries. It will try to establish the best practices and must-avoid mistakes in such implementation in the hope that it will be of value to the countries that have yet to follow the e-invoicing trend.

1. INTRODUCTION

There is a high demand for increased efficiency in business operations. Organizations are expected to be lean, processes optimized and agile. In one field the government is leading the way – standardized electronic business processes.

An informal task force on e-Invoicing, commissioned by the European Commission, found that electronic invoices would be a fundamental enabler in European competitiveness by reducing supply chain costs by 243 million euros across the continent. In addition the process will help streamline business processes and help drive innovation (EEI, 2007). Organizations can expect savings of 60-80% in comparison to paper invoice processing (Koch). Last but not least, electronic invoicing is believed to be on average four times more environmentally friendly and can therefore be seen as a giant step for businesses striving to minimize their carbon footprint (Federation of Finnish Financial Services, 2010).

This is not the first e-business initiative governments have tried to put in place. In the beginning of the millennium governments all over the world were implementing e-procurement. Those projects were considered notoriously unsuccessful (Steinberg, 2003). Vaidya, Sajeev & Callander (2006) concluded that

---

[1] Rebekka Helga Aðalsteinsdóttir(1982). MPM student, B.Sc. in Business. Email: rebekka08@ru.is

those e-procurement implementation projects "had a greater reach and scope than traditional IT development projects" and therefore should be managed differently.

This paper examines the critical success factors and the critical risk factors in the management of such wide scope projects. By studying the factors that have already been identified and surveying project managers responsible for the e-invoicing initiative in three countries an effort will be made to answer the following research question:

What are the key success factors in a national IT infrastructure project and what are the pitfalls to avoid?

2. LITERATURE REVIEW

The public sector in Europe is likely to become not only a key driver in the adoption of e-invoices but game changer number one (Koch, 2014). Scandinavia took on the role of the early adaptor when in 2005 the Danish government mandated that all invoices would be received electronically (Koch, 2014). In the years to come the rest of Scandinavia followed, Sweden in 2008 (The Swedish National Financial Management Authority, 2014), Finland in 2010, Norway in 2013 and finally Iceland in 2015 (EEI, 2012). Although not mandatory in Sweden and Iceland they still have a national standard that is the only allowed standard in business-to-government (B2G) invoicing (Koch, 2014). This is the first step in the movement towards the real-time-economy, meaning the environment where all business transactions are conducted in real-time (Penttinen, 2008).

The term e-invoicing has various definitions (Koch, 2014). In this paper the term is used for the electronic interchange of VAT compliant, structured invoice data from business-to-business (B2B) and business-to-government (B2G). This has been dubbed as "touchless e-invoicing" or "zero touch e-invoicing" as it does not require manual processing of any sort (Koch, 2014). In order to achieve this goal, and fully realize the cost benefits, the electronic invoice has to be fit for automation and therefore has to be sent in a structured format (Koch, 2014). Here technical aspects will be set aside as there are many good articles on that subject readily available. In short all suppliers send the same structured format invoice to an e-invoicing network that routes the document to the receiver. By using the same structured format all suppliers can send one type of e-invoices to all customers and the receiver only has to implement one process for all incoming e-invoices. This is illustrated in Figure 1 below.
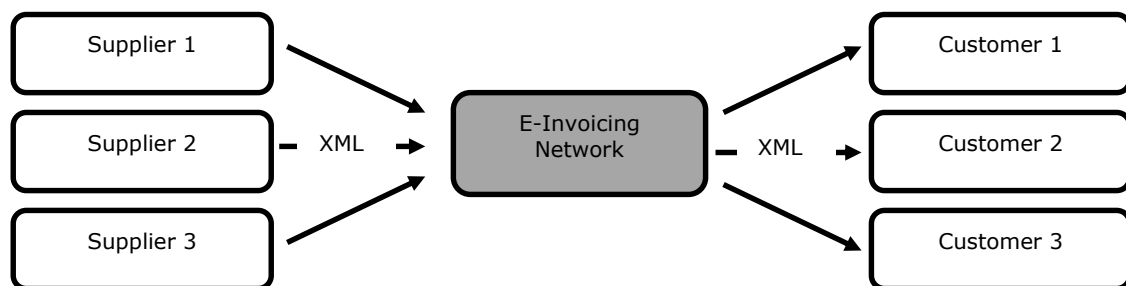

Figure 1 - Network model of e-invoicing

This "one national standard" is the way Scandinavia has chosen and therefore reaps the benefits that derive from a unified method of e-invoicing

(Digitaliseringsstyrelsen, n.d.) (Difi, n.d.) (SFTI, 2015) (Federation of Finnish Finacial Services, n.d.) (FUT, n.d.).

What makes the implementation of such a national standard an interesting project to research is the fact that it is really a project that initiates thousands of other projects as 45-65% of local organizations are suppliers to the public sector and therefore have to initiate their own e-invoicing projects (Koch, 2014). This changes the structure and facilities needed for the operation of the majority of organizations and can therefore be defined as a national IT infrastructure project.

The EU is boarding the e-invoicing train using the same methodology as Scandinavia by adopting a European standard for e-invoicing. On September 9th 2014 the European Committee for standardization launched a new project committee (CEN/PC 434) which is in charge of developing this standard (European Committee for Standardization, n.d.). The standard is to be mandatory for all member states in the third quarter of 2018 (European Commission, 2014).

As for the term implementation, the Oxford English dictionary defines it as being: The process of putting a decision or plan into effect (Oxford English Disctionary, 2015). Another much narrower definition is from Ginzberg (1979) who stated that implementation is "an effort beginning with the first thought of developing a system and not ending until the project is completed or abandoned". That is the definition that will be adopted in this paper.

Project Excellence
Neither PMBok nor IPMA ICB define excellence in projects. Many studies have been conducted on the subject but here two models will be discussed, the Westerveld PEM (Project Excellence Model) and IPMA PE (Project Excellence) model.

In order to evaluate a project's success criteria and critical success factors there has to be a defined model that can link the two together (Westerveld, 2003). One such model is the Project Excellence Model introduced by Westerveld in 2003. The model, which is based on the EFQM business excellence model, consists of six result areas covering *project success criteria* and six organizational areas covering *critical success factors* see Figure 2. It is aimed to answer a growing need for a management model to aid project managers in dealing with complex projects. The model is based on the notion that successful project management relies on the organization having focus on both the result area containing project success criteria and the organizational area containing critical success factors.
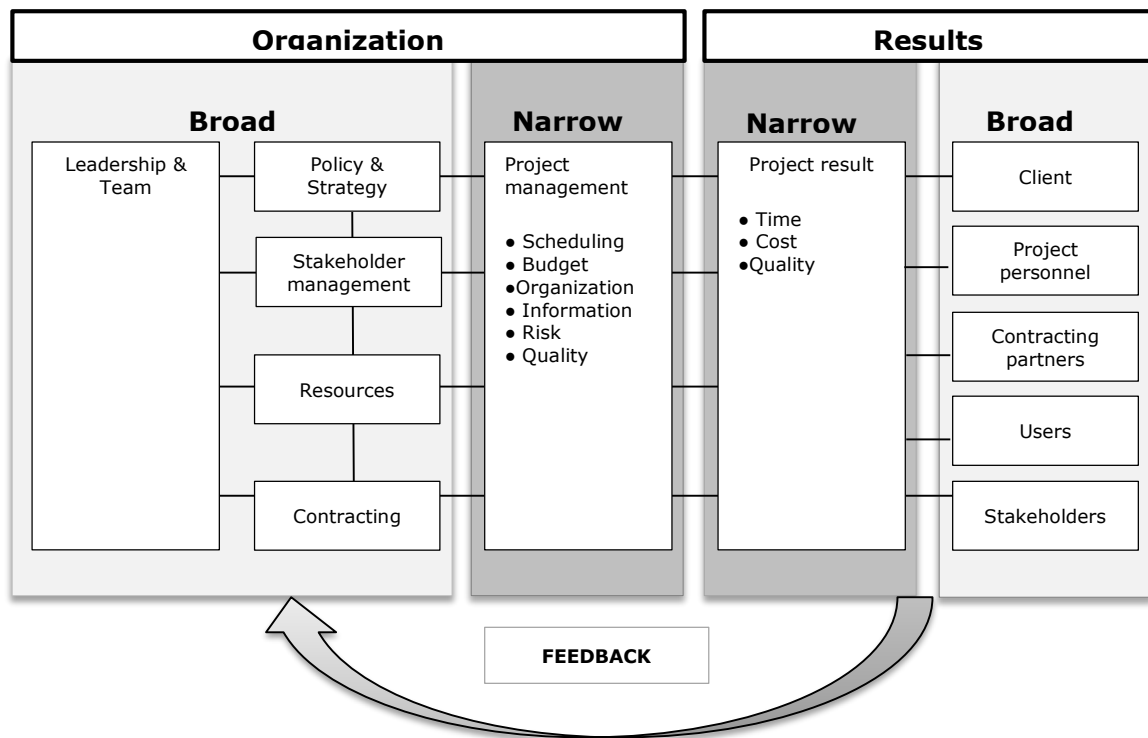
Figure 2 - The project excellence model (Westerveld, 2003)

Another very similar model is the IPMA PE model. That model is also based on the EFQM business excellence model. The IPMA PE model consists of five criteria to evaluate project management and four criteria to evaluate project results. The model is used as an assessment tool for the IPMA International Project Excellence award where both brilliant approaches in projects are identified and excellent performance in project management is awarded (IPMA, 2013).
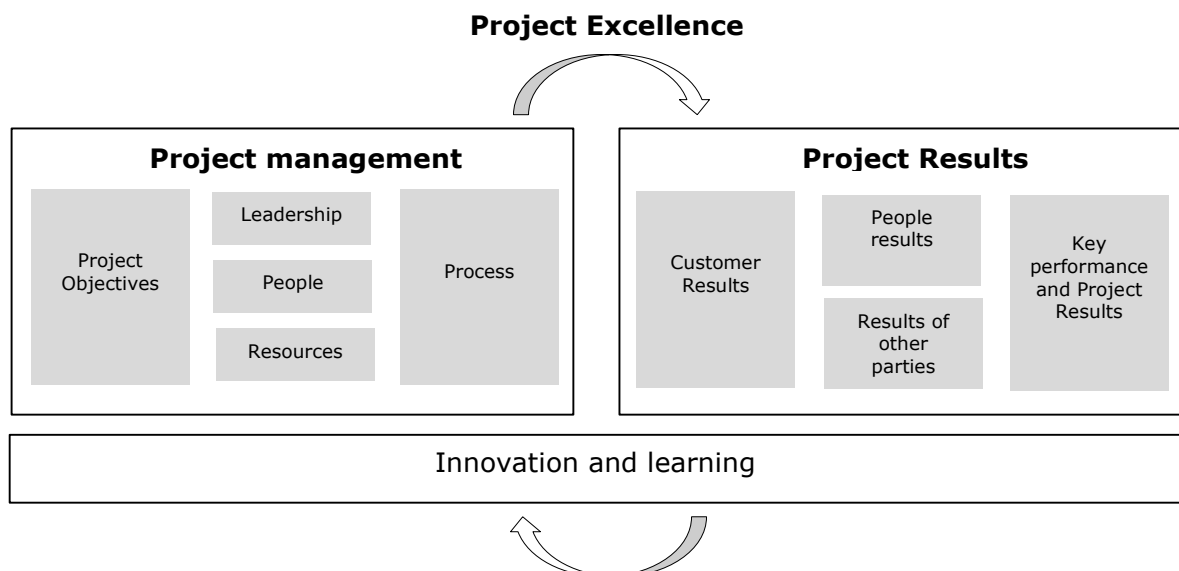

Figure 3 - IPMA PE Model (IPMA, n.d.)

The difference between the two models is three fold as Westerveld's model has twelve areas whereas the IPMA model only has nine.

1. Westerveld and IPMA both define clients, project personnel and other stakeholders as stakeholders but Westerveld also specifically defines users and contracting partners.

2. In Westerveld's model stakeholder management gets a specific category where in the IPMA model it is intertwined into other categories and not as definite.

3. Westerveld's model includes contractor management whereas IPMA does not.

Further comparison between the two models can be found in Table 1.

Table 1 - Comparison between Westerveld's PEM and the IPMA PE model

WESTERWELD PROJECT EXCELLENCE MODEL			IPMA PROJECT EXCELLENCE MODEL		
NO.	RESULT AREA	EXPLANATION		PM AREA	**NO.**
1	Project results • Budget • Schedule • Quality	The original golden triangle of project goals. Almost all projects will have specific scheduling, budget and quality constraints.	What the project achieves regarding the intended project results.	Key performance and Project results	**9**
2	Appreciation by the client	The client initiates the project to fulfil a specific need. What aspects and factors does the client value in judging the success of the project?	What the project archives regarding customer expectations and satisfaction. It has to demonstrate how customers judge the project in its achievements and results.	Customer results	**6**
3	Appreciation by project personnel	The workers of the project will be concerned with reaching their personal goals as well as a good working atmosphere.	What the project achieves concerning expectations and satisfaction of the employees involved. It should demonstrate how employees and managers judge the project.	People results	**7**
4	Appreciation by users	Users are concerned with their overall influence in the project and the functionality of the end product			
5	Appreciation by contracting partners	Contracting partners try to make a profit from the project. They are also concerned with getting new orders and learning possibilities.			
6	Appreciation by stakeholders	Those parties that are not directly involved in the projects but have a large influence. For example environmental groups, citizens and government agencies. These parties manage their specific interests.	What the project achieves concerning expectations and satisfaction of other stakeholders.		**8**

WESTERWELD PROJECT EXCELLENCE MODEL			IPMA PROJECT EXCELLENCE MODEL		
NO.	RESULT AREA	EXPLANATION	EXPLANATION	PM AREA	NO.
7	Leadership and team	Represents the way the project manager runs the project and how tasks and responsibilities are divided. Leadership style of and co-operation in the project team greatly influence the working habits within the project organization.	How the behavior of all managers of and within the "Project Excellence" inspires, supports and promotes. How project team members are involved, how their potential is seen and utilized.	Leadership & People	2 & 3
8	Policy and strategy	What are the project goals and how are they accomplished. Combining the interest of stakeholders into an end product.	How the project formulates, develops, checks and realizes its objectives based on the extensive information about the demands of the stakeholders involved.	Project objectives	1
9	Stakeholder management	How does the project interact with various stakeholders? The co-operation of the project organization with external parties determines the place of the project in its environment.	NA	NA	NA
10	Resources	Resources have to be utilized in an efficient manner in order to achieve maximum benefits for stakeholders involved.	How existing resources are used effectively and efficiently.	Resources	4
11	Contracting	Each project organization establishes contractual relationships. The choice of contracts and partners evolves around the tasks at hand and the competencies of contracting parties.	NA	NA	NA
12	Project management • Scheduling • Budget • Organization • Quality • Information • Risks	How does operational control of the project take place? The traditional aspects of sound project control play a key role in this process.	How important processes within the project are identified, checked and changed, if necessary.	Processes	5

(IPMA, 2013; Westerveld, 2003)

KNOWN CRITICAL SUCCESS FACTORS (CSF) AND CRITICAL RISK FACTORS (CRF)

Not a lot has been written about the project management side of the implementation of e-invoicing. Billentis releases an extensive report each year about the status worldwide and a white paper has been released on the government implementation in Finland. Vaidya, Sajeev & Callander wrote an article about the critical factors in e-procurement initiatives in 2006 which can be grouped with e-invoicing. The literature on why IT projects succeed or fail is more extensive. Here two articles are examined on the subject. One is the research into successful implementation of IT Projects and the other an analysis of failed projects and their risk factors.

Billentis' report points out that the most important challenges are the process automation and the high number of suppliers and customers that are taken aboard in a short timeframe. There are three risk factors and nine success factors defined in the report all focusing on the human side of project management (Koch, 2014).

The Helsinki School of Economics released a white paper on the Finnish initiative in 2008. Through interviews with eight organizations, both public and private, they identified three perceived diffusion factors. The first applies to stakeholder management, the second to management support and the third to the maturity of the technology (Penttinen, 2008).

Vaidya, Sajeev & Callander (2006) concluded that e-procurement implementation projects "have a greater reach and scope than traditional IT development projects" and "that e-procurement projects tend to be more incremental and component-driven and thus rely less on traditional system development life cycle (SDLC) methods. Instead, developing business cases and undertaking pilot projects were found to be more common practices in e-procurement projects". They also determine that the project involves a significant number of internal and external stakeholders including end-users, suppliers, service providers, consultants and sponsors. The importance of their involvement is identified as one of the most important part of the success of the project. That corresponds to the fact that their research also found that the most important factors were user uptake and training along with supplier adoption. They found that there were three perspectives of critical success factors that would impact the implementation success. Organization & management, practices and processes and systems & technology.

Khaled Almgren (2014) did a comprehensive study on successful implementation of IT projects. He found eight factors that cause IT project failure and six factors essential for IT project success.

Alton Y.K. Chua analyzed eight failed IT prjoects and found that critical risk factors can be classified into people-related factors, process-related factors, technical-related factors and extra factors.

In order to visualize the critical risk factors and critical success factors in the analysis discussed so far and connect them to project excellence a common overview is presented in
Table 2. The CSF and CRF have been categorized using Westerveld's PEM model.

Table 2 - Overview of CRF and CSF

BILLENTIS (Koch, 2014)	HELSINKI SCHOOL OF ECONOMICS (Penttinen, 2008)	CRITICAL FACTORS IN E-PROCUREMENT IMPLE-MENTATION (Vaidya, Sajeev, & Callender, 2006)	SUCCESSFUL IMPLE-MENTATION OF IT PROJECTS (Almgren, 2014)	RISK FACTORS IN FAILED IT PROJECTS (Chua, 2009)
PROJECT RESULTS				
				CRF: Testing CRF: Other on-going projects CRF: External changes
STAKEHOLDER INVOLVEMENT AND APPRECIATION				
CRF: Too technical focus CSF: Internal and external communications	CSF: Internal and external communications CSF: Training and information	CSF: Reengineer the supplier relation-ships as well as the processes CSF: Realization of changes to roles CSF: Communi-cation with the users and suppliers CSF: Training of staff CSF: Confidence in the infrastructure	CRF: Insufficient user involvement CRF: Lack of communication with IT developer CRF: Lack of competent staff CRF: Reluctance of personnel	CRF: Lack of stakeholders' involvement CRF: Users' unfamiliarity with system
LEADERSHIP AND TEAM				
CSF: Management support CSF: Being a rollout champion	CSF: Management support	CSF: Championing the project	CRF: Lack of oversight by senior management CSF: Senior management take an active part in the project	CRF: Overly ambitious top managers
POLICY AND STRATEGY				
CSF: Awareness of potential in a broader sense CSF: Timed objectives CSF: quick gains for first step CSF: Realistic technical capabilities CSF: Not reinventing solutions CSF: Realistic technical capabilities of your suppliers and customers	CSF: Mature technology and established standards	CSF: Senior management sponsorship CSF: Senior management leadership CSF: imple-mentation plan. CSF: Identify drivers, starting point, benefits, approaches, affordability and risk. CSF: Key per-formance indicators CSF: Documented and executable strategies prior to the deployment CSF: Determine integration level CSF: Data interoperability	CSF: Organizational support CRF: Lack of strategic planning CSF: Benchmarking CSF: Strategic plan CSF: Planning	CRF: Unclear scope and requirements CRF: High technical complexity CRF: Inexperienced clients or vendors

		CSF: Realize the level of e-readiness of suppliers		
RESOURCES				
			CSF: Availability of resources	
PROJECT MANAGEMENT				
CRF: Under-estimating significance of departments involved CRF: Poor project management CSF: One very active project owner	CSF: One active project owner	CSF: Change management	CRF: PM experience CSF: Strong leadership and project management skills	CRF: Unrealistic schedule CRF: Poor budgetary control CRF: Approach to project development CRF: Lack of change control

By simply counting the CSF and CRF in each category a spider web emerges in Figure 4. It shows that factors contributing to Policy and Strategy are dominant (17, 4). Second are factors contributing to stakeholder involvement and appreciation (5, 7). Third are project management (7, 4) factors. The other four categories score much lower, leadership and team factors (5, 2), project results (3, 0), resources (1, 0) and lastly no contracting factors were mentioned.
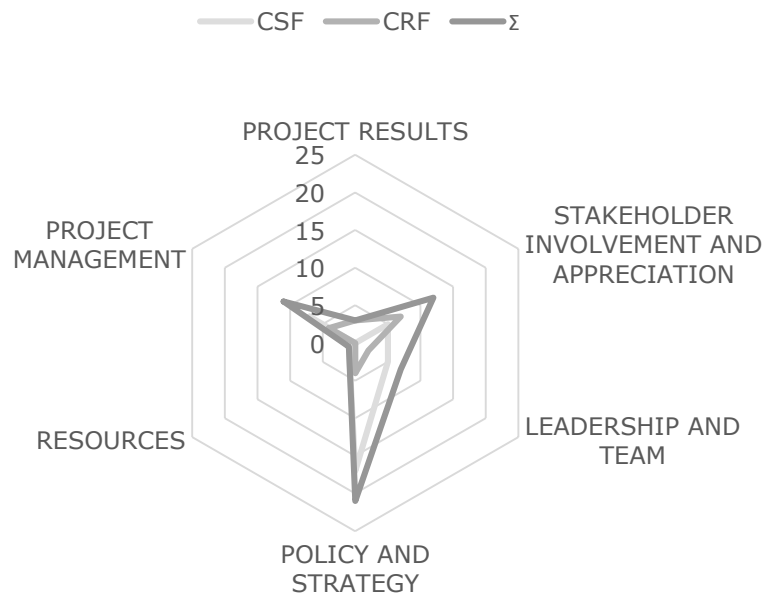

Figure 4 - CSF and CRF item count by category

3. RESEARCH METHOD

The goal of the research is to identify the key success factors and key risk factors in national IT infrastructure projects regarding e-business initiatives. As the research is on national level and not many nations have begun the implementation

a decision was made to concentrate on the leaders in the north. Figure 5 shows the status of the implementation worldwide.

Figure 5 - Market maturity for electronic invoices/bills

As the sample for the research is so small and the aim to answer such open questions, a qualitative method was reasoned most appropriate. Marshall (1996) defined the purpose of a quantitative approach as "to test fore-determined hypotheses and produce generalizable results answering the 'what' questions". While his definition of the purpose of qualitative approach is "to aim to provide illumination and understanding of complex psychosocial issues and are most useful for answering humanistic 'why?' and 'how?' questions".

As the research is focused on a one-time-only project it can be considered a case study. Yin (1994) defines a case study as:

An empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

Research description and objectives
In order to accomplish the goal a questionnaire was sent out to two project managers that had been the lead project manager for the implementation in their country. The countries chosen were Denmark, the first Nordic country to implement e-invoices and Iceland the last country to complete the implementation. The reason those two countries were selected was to see if the assessment off CRF and CSF differed between the pioneer and the one that followed.

The lead project manager for the implementation of electronic invoices was identified in Denmark and Iceland by sending an email to the appropriate authority in each country. A questionnaire was then sent out to each of the project managers for them to answer by email. All questions were open and participants were encouraged to answer in detail.

The questionnaire was based on the Westerveld Project Excellence Model and addressed six critical risk factors and critical success factors. Each participant was asked:

11

What would you identify as the major success/risk factor for

- keeping the project within budget, time and quality?
- stakeholder management?
- the project leadership?
- policy and strategy?
- resources?
- project management?

In addition the participants were asked if they had an IPMA certification, what their leadership style was and if they were the project manager for the whole duration of the project. Finally they were asked if the project was officially completed, who initiated it and how they would categorize the project:

- Business Change project
- Information Technology project
- Infrastructure investments project
- Business process reengineering project

The answers along with some available information on the cases will be used to study, classify and evaluate the critical success factors and critical risk factors in the projects. The results would likely have been more accurate if project managers for similar projects in more countries would have participated in the research. Also in-depth interviews might have been less restricting than a written questionnaire.

4. RESEARCH RESULTS

In this section the questionnaire results are presented along with additional information on each case.

Denmark's implementation of NemHandel
Denmark was the first Scandinavian country to implement and mandate electronic invoices in 2005. This directly affected approximately 70% of all Danish businesses. An even higher portion was indirectly affected as the initiative also aimed to replace costly invoicing solutions in a business-to-business context. To ease the implementation the Danish National IT & Telecom Agency (NITA) launched a national framework, NemHandel (i.e. Easy trade), which is an open e-business framework. As a supplement NITA also released a basic open source NemHandel application used to exchange electronic business documents via the internet. The application is distributed freely and can be used to incorporate the technology in other products (Lippert, 2008).

According to Cathrine Lippert (2008), an innovation & strategy specialist at NITA, The establishment of NemHandel and the open reference application:

a) Provided businesses, who were required by law to send all invoices electronically to the public sector, with a cost-effective solution

b) Encouraged the over-all digitization of business processes in the private sector. Both objectives would reduce the administrative burdens of Danish businesses, particularly SMEs, by lowering the barriers for e-business and for general digitization of administrative processes. Providing the infrastructure and basic software for e-business, the NemHandel initiative allowed private companies of any size to participate in electronic supply chains and other business

interactions due to the low technical, administrative, and economic barriers.

According to Mrs. Lippert the success factors were:

- The thoroughly positive business case of significant reduction of administrative burdens and considerable financial savings.

- The development of the NemHandel framework on the basis of actual business requirements gathered through an open dialogue with businesses, public authorities, trade associations and IT vendors and solution providers.

- The use of the pervasive and well-known basic platform, the internet (2008).

In Denmark there were two project managers for the duration of the project. The first oversaw the planning phase and build of the first proof-of-concept/pilot project and when that phase was completed another project manager took over. The leadership styles of the two project managers differed widely (Schade-Sørensen, 2015). The first one had a transformational leadership style which has been described as the style best suited for when radical changes have to be made. The role of such a leader is to create and maintain the team's focus on the goals and final product. His focus is on the results rather than his persona or his connection to the team (Jonasson & Ingason, 2011). The second project manager had a democratic and laizzez-faire leadership style. That kind of leader focuses on the team, giving them freedom to decide on the best solutions since the team is mainly composed of experts. This style is best suited to remove reluctance to change following a decision to implement (Jonasson & Ingason, 2011).

Helle Schade-Sørensen (2015) was the second project manager in Denmark. When asked how she would categorize the project she answered:

It was an Information Technology project and an Infrastructure project. But it involved business change for those using it, especially for our community of IT-vendors and service providers.

Iceland's implementation of NES/UBL
The Icelandic implantation of a national standard for electronic invoices began in 2001 when it was made a compulsory condition for a tender on a new ERP system for the government. Shortly after the Danish government started their implementation a joint committee containing all the Nordic countries and Britain was formed to develop a common standard for electronic invoices (Ministry of the Interior, n.d.). The committee, called NES (North European Subset), delivered the first version of the standard in March 2007 (NESUBL, n.d.). The same year the Icelandic government began preparing theirs systems for the standard. The solution was developed and tested until mid-year 2008 when it was officially launched (Ministry of the Interior, n.d.).

Small businesses and individuals received special attention in the implementation and their involvement in the project was ensured. The emphasis was on a technical standard that would not only suit the government needs but also the needs of the private market. The government issued a directive in October 2014 mandating that all invoices to the government should be electronic from January 2015 (Ministry of finance and economic affairs, 2014).

Critical success factors (CSF) and critical risk factors (CRF)
Mrs. Shade-Sørensen (2015) and Mr. Skulason (2015) were asked about the CSF and CRF for these six aspects:

- keeping the project within budget, time and quality?
- stakeholder management?
- the project leadership?
- policy and strategy?
- resources?
- project management?

The result of the questionnaire (see Appendix I) were categorized using Westerveld's PEM model and are presented in Table 3.

Table 3 - Result of questionnaire on CRF and CRF

DENMARK (Schade-Sørensen, 2015)	**ICELAND** (Skulason, 2015)
PROJECT RESULTS	
CSF: • First a proof of concept project and then a pilot • The project began small and was slowly scaled up • Scrum as a development method as they were building something totally new and untested.	**CSF:** • First a proof of concept project and then a pilot
CRF: • No experiences to lean on as they were building something totally new • A lot of surprises on the way	**CRF:** • No master schedule nor budget for the project as a whole
STAKEHOLDER INVOLVEMENT AND APPRECIATION	
CSF: • Stakeholders were involved in technical hearing before start up • Help with stakeholder implementations after launch • Project platform on Digitaliser.dk • Quarterly meeting with biggest NemHandel Service providers	**CSF:** • The government did not use its power to force a specific solution • Collaborative forums on both the standardization and implementation
CRF: • Not taking stakeholder concerns and problems seriously	**CRF:** • The governments bargaining power • The governments double role as both a huge buyer and a mediator • Variations in business processes lead to complications
LEADERSHIP AND TEAM	
CSF: • Beginning with a transformational leader to raise awareness, money and acceptance • Switching to a democratic and laizzez-faire leader when it was time to focus on improvements, governance and stability	**CSF:** • Management support • Clear goals • Clear examples and benchmarking with other countries

CRF:	CRF:
• Much of the work done by highly skilled and expensive external consultants	• The government is not a single entity but a collection of independent agencies • Small agencies that do not realize the gains

POLICY AND STRATEGY	
CSF: No answer	**CSF:** • Consultations with stakeholders and their forums • Use of international standards • Nordic precedent • Full support of the ministry
CRF: No answer	**CRF:** • Lack of electronic procurement policy from the government • Disagreement of standards to use • Lack of involvement from the financial sector e.g. banks

RESOURCES	
CSF: • Resources were made available as it was a high profile project	**CSF:** No answer
CRF: No answer	**CRF:** • The length of the project exceeds 10 years

PROJECT MANAGEMENT	
CSF: No answer	**CSF:** No answer
CRF: No answer	**CRF:** • The length of the project • Unclear task division between internal stakeholders

5. DISCUSSION

As Denmark was the first to implement and mandate electronic invoices their hurdles were arguably greater than in Iceland. The fact that it was a pioneering project made it difficult to plan and impossible to benchmark. There is still a clear similarity between the CSF and CRF in both projects and conformity with the CSF and CRF from
Table 2 - Overview of CRF and CSF.

Both countries consider the fact that they began with a proof of concept project followed by a pilot project to have contributed to the overall success of the project. Denmark used Scrum as a development method with good results and began small and slowly scaled up the project. This may have balanced out the fact that they had no experience to lean on and surprises were bound to occur in such a first-off project. Interestingly Iceland's project had no formal master schedule nor budget but their goals were clear and the project is considered a success.

Regarding stakeholder involvement and appreciation it is clear that in those two projects as in the compilation of researches in

Table 2 that collaboration is key. Internal and external communications in an open forum where people can speak their minds and be listened to is clearly one of the most mentioned CSF and the lack there of the most mentioned CRF. The Icelandic project manager also mentions that the government did not use its authority to force the implementation, as they probably could have, but rather collaborated with stakeholders on both the standard and the implementation.

It is interesting how the Danish deliberately switched project managers mid-project. The role of the first PM was to raise awareness, money and acceptance and his leadership style matched that role. The second was supposed to focus on improvements, governance and stability and therefore had to have a different leadership style.

The Icelandic project manager points out that the fact that they could seek examples and benchmarks to other countries contributed to their success. Therefore they could learn from the mistakes of those who came before and copy their successes. He still points out that the government is not a normal business and their complex organization makes for complex project management.

Both countries relied on a standard that was readily available and neither tried to reinvent solutions that were already available. Despite that Denmark had to do some serious technical innovation where there were no existing solutions. Their strategic plan and the clarity of the scope and requirements could not be clear from the beginning.

Resources, or the lack thereof, is not identified as a CSF nor CRF. Neither in the compilation of researches in
Table 2 nor in the answers of the project managers.

The two project managers do not comment a lot on the actual project management aspect of the implementation. One could speculate that they do not want to assess their own methods and management. Another thing that might be the cause is the research method, in depth interviews might have shed a better light on the factors of project management than a written questionnaire.

6. CONCLUSIONS

In the IPMA Project Excellence Model assessment it is stated that the customer has to be "king" (IPMA, 2013). Even though the term customer has many meanings (government agencies, suppliers to the government, businesses, users etc.) in such huge IT infrastructure projects it can be concluded that it applies to all its meanings. Collaboration and joint understanding of the project goals can be considered as a major contributing success factor. In order for that to be achieved it is important to begin with the end in mind. That is, solid strategic planning and clear scope and requirements. The project has to be led by a firm hand continuously assessing the situation and reacting to changes in the project.

Further research on the subject is needed to better illustrate the factors that contribute to a successful implementation of e-business infrastructure projects. By examining the rest of the Nordic and even South American countries that have implemented a clearer trend might emerge. It could also be useful to monitor an implementation in one country from the beginning of the project to the end.

A perfection of means, and confusion of aims, seems to be our main problem. – Albert Einstein

7. ACKNOWLEDGEMENT

8. REFERENCES

Almgren, K. (2014). Information technology project management processes and practices: A comprehensive study for successful implementation of IT projects. *International Journal of Business and Social Science, 5*(11).

Chua, A. Y. (2009). EXHUMING IT PROJECTS FROM THEIR GRAVES: AN ANALYSIS OF EIGHT FAILURE CASES AND THEIR RISK FACTORS. *The Journal of Computer Information Systems, 49*(3), 31-39.

Difi. (n.d.). *Elektronisk handel (E-handel)*. Retrieved april 10, 2015, from Anskaffelser.no: http://www.anskaffelser.no/elektronisk-handel

Digitaliseringsstyrelsen. (n.d.). *Nemhandel - Standarden for e-samhandel*. Retrieved april 10, 2015, from Nemhandel: http://www.nemhandel.dk/om-nemhandel

EEI. (2007). *European electronic invoicing.* European Commission Informal Task Force on e-Invoicing .

EEI. (2012, june 28). *An overview of 56 Government E-invoicing initiatives.* . Retrieved from E-invoicing platform: http://eeiplatform.com/8528/an-overview-56-government-e-invoicing-initiatives-anything-missing-here/

European Commission. (2014, march 11). *E-invoicing in public procurement: frequently asked questions*. Retrieved april 10, 2015, from http://europa.eu/rapid/press-release_MEMO-14-179_en.htm

European Committee for Standardization. (n.d.). *e-Business*. Retrieved from European Committee for Standardization: https://www.cen.eu/work/areas/ict/ebusiness/pages/default.aspx

Federation of Finnish Finacial Services. (n.d.). *Finvoice product information*. Retrieved april 10, 2015, from Finvoice electronic invoice: http://www.fkl.fi/verkkolasku/english/electronic_invoice_for_companies/finvoice_product_information.htm

Federation of Finnish Financial Services. (2010). *Environmentally friendly electronic invoice.*

Finland's EU Presidency. (2006, november 20). The Helsinki Manifesto. Helsinki, Finland.

17

FUT. (n.d.). *Tækniforskriftir*. Retrieved april 10, 2015, from Staðlaráð Íslands: http://stadlar.is/stadlastarf/fagstadlarad-i-upplysingataekni/taekniforskriftir.aspx

Ginzberg, M. J. (1979). A study of the Implementation Process. In R. Doktor, R. L. Schultz, & D. P. Slevin (Ed.), *TIMS Studies in the Management Sciences* (pp. 85-102). New York: ACM Press.

IPMA. (2013). *Project Excellence Model and IPMA International Project Excellence Award.*

IPMA. (n.d.). *The PE Model*. Retrieved march 30, 2015, from IPMA: http://ipma.ch/awards/project-excellence/the-pe-model/

Jonasson, H. I., & Ingason, H. T. (2011). *Leiðtogafærni - Sjálfsskilingur, þroski og þróun.* Reykjavik: JPV.

Koch, B. (2014). *E-Invoicing and E-billing - Key stakeholders as gamechangers.* Wil: Billentis.

Lippert, C. (2008, october 14). *NemHandel - Open Infrastructure for E-Business*. Retrieved april 12, 2015, from European Commission - JoinUp: https://joinup.ec.europa.eu/node/133771

Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice, 13*(6).

Ministry of finance and economic affairs. (2014, october 31). *Rafrænir reikningar frá 1. janúar 2015*. Retrieved april 20, 2015, from Fjármála og efnahagsráðuneytið: http://www.fjarmalaraduneyti.is/frettir/nr/18614

Ministry of the Interior. (n.d.). *Fjársýsla ríkisins - brautryðjandi í notkun rafrænna reikninga*. Retrieved april 20, 2015, from UT vefurinn: http://www.ut.is/rafraen-vidskipti/innleiding/frumkvodlar/nr/4253

NESUBL. (n.d.). *What is NES?* Retrieved april 20, 2015, from NESUBL: http://www.nesubl.eu/

Oxford English Disctionary. (2015). *Implementation*. Retrieved from http://www.oxforddictionaries.com/definition/english/implementation

Penttinen, E. (2008). *Electronic invoicing initiatives in Finland and in the European Union - Taking the steps towards the real-time economy.* 2008: Helsingin kauppakorkeakoulu.

Schade-Sørensen, H. (2015, april 22). Questionnaire on e-invoicing initiative. (R. H. Adalsteinsdottir, Interviewer)

SFTI. (2015, february 13). *Svefaktura*. Retrieved april 10, 2015, from SFTI: http://www.sfti.se/svefaktura

Skulason, B. (2015, april 26). Questionnaire on e-invoicing initiative. (R. H. Adalsteinsdottir, Interviewer)

Steinberg, R. (2003). *Strategies for successful government E-Procurement.* Stamford: Gartner.

The Swedish National Financial Management Authority. (2014, december 17). *E-commerce*. Retrieved april 10, 2015, from ESV: http://esv.se/ESV/English/E-commerce/

Vaidya, K., Sajeev, A. S., & Callender, G. (2006). Critical Factors that influence e-procurement implementation success in the public sector. *Journal of public procurement, 6*(1 & 3), 70-99.

Westerveld, E. (2003). The Project Excellence Model®: linking success criteria and critical success factors. *International Journal of Project Management, 21*(6), 411-418.

Yin, R. K. (1994). *Case study research.* Thousand Oaks, CA: Sage.

APPENDIX I – QUESTIONNAIRE

Following is a questionnaire regarding the project management of the government initiative to implement E-Invoicing in [Country]. The questionnaire is a part of a research for a Master's Thesis in Project Management at Reykjavik University. Please answer all questions to the best of your knowledge and detailed answers are appreciated.

General

Your name:

Your organization:

How long have you been involved in project management?

Do you have an IPMA certification and if so what level?

How would you best describe your leadership style?

Were you the project manager for the whole duration of the project?

The Project

How would you categorize the project and why?

- Business Change project
- Information Technology project
- Infrastructure investments project
- Business process reengineering project

Is the project officially completed?

Who initiated project and why?

Project results

What was the original timeframe for the project?

How was the timeframe divided between scheduling, executing and closing the project?

When was is completed? (If the project is ongoing please state the estimated completion date)

If the project was not completed on time why do you think that was and what actions were taken? (If the project is ongoing please comment on its progress)

What was the original budget for the project?

What was the end budget for the project? (If the project is ongoing please state the estimated end budget)

If the project was not on budged why do you think that was and what actions were taken?

(If the project is ongoing please comment on its ongoing budget)

Did the project deliver the expected results? (If the project is ongoing please state the estimated deliverables at the end of the project)

<div style="border:1px solid black; padding:10px;">

What would you identify as the major success factor for keeping the project within budget, time and quality?

</div>

<div style="border:1px solid black; padding:10px;">

What would you identify as the major risk factor for keeping the project within budget, time and quality?

</div>

Stakeholder involvement and appreciation

How were stakeholders identified?

Who were the identified stakeholders?

Were their interests, requests, needs and fears defined?

Was there any formal interactions with the stakeholders and if so how was it managed?

Did stakeholders needs and interests change during the project and if so how was that handled?

Would you say that the client was satisfied with the end result? If not why do you think that was?

Would you say that the user was satisfied with the end result? If not why do you think that was?

Would you say that the contracting partner was satisfied with the end result and if not why do you think that was?

Would you say that other stakeholders were satisfied with the end result and if not who were not and why?

What would you identify as the major success factor for stakeholder management?

What would you identify as the major risk factor for stakeholder management?

Leadership and team

Was there adequate support from management in the governing organization?

Did senior management take active part in the project?

Was there a project champion within the governing organization?

Did the management in the governing organization oversee the implementation of the project?

<div style="border:1px solid black">

What would you identify as the major success factor for the project leadership?

</div>

<div style="border:1px solid black">

What would you identify as the major risk factor for the project leadership?

</div>

Policy and strategy

Were senior executives aware of the potential of the project in a broader sense?

Was there a clear strategy for the project?

Was there a clear implementation plan?

Did the implementation plan reflect the strategy?

How were the objectives of the project determined?

Were specific goals set up for the project?

If yes how were they monitored?

If yes were the goals reached?

23

What were the key success factors for the project? (For the customer, the user, the seller etc.)

<div style="border:1px solid black; padding:10px;">

What would you identify as the major success factor for policy and strategy?

</div>

<div style="border:1px solid black; padding:10px;">

What would you identify as the major risk factor for policy and strategy?

</div>

Resources

Were resources made available throughout the project as they were needed?

<div style="border:1px solid black; padding:10px;">

What would you identify as the major risk factor regarding resources?

</div>

<div style="border:1px solid black; padding:10px;">

What would you identify as the major risk factor regarding resources?

</div>

Project management

How was the project team assembled?

How were tasks and responsibilities divided?

Was there one project owner?

Was change management addressed?

24

What would you identify as the major success factor for the project management?

What would you identify as the major risk factor the project management?

Lastly...

What is your personal view on how the project was run and how it turned out?

What would you identify as the main challenges and how were they resolved? Please rate the answers in order of importance

If you had to do it all over again what would you do differently? Please rate the answers in order of importance

What would you do again? Please rate the answers in order of importance

Have you managed another type of project? If yes then please specify what kind of projects

Where there any differences in managing those projects?