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Analyzing Trust Perceptions In System Implementations

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ANALYZING TRUST PERCEPTIONS IN SYSTEM IMPLEMENTATIONS

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Abstract

Implementations of large scale information systems are complex and problematic with a reputation for being delayed and going over budget. A critical factor in the success of these implementations is trust in the system, in the project and between the various stakeholders. As problems and delays mount, trust relations become strained, leading to a circle of suspicion and disbelief which is both destructive and hard to break out of. This case study analyses trust relations during a problematic period of time in the implementation of the Faroese integrated healthcare information system, using a framework based on Giddens´ theory of modernity. The framework theorizes dynamic elements of the evolution of trust, not previously investigated in this context. The data collection involves 4 actors interviewed twice in 2006 and 2007; and the data analysis strategy is content analysis using Nvivo software. A major contribution is that if an implementation project interacts with many or complex abstract systems, the managers must focus on continuous embedding and re-embedding by interacting directly with representatives of the abstract systems in question to maintain trust. Also we observe that actors' perceptions of trust relations influence future actions, and in this way have both negative and positive consequences. We also conclude that Giddens' theories of trust provide a promising insight into the dynamic aspects of trust relations in implementation projects, which go further than trust theories currently used in the IS field.

Keywords: Trust, Implementation, Giddens, Modernity, Abstract Systems

1   INTRODUCTION

The implementation of large scale standardized information systems (Enterprise Resource Planning systems, Customer Management Systems and Integrated Healthcare Information Systems) is often reported as problematic. There are many reasons for these difficulties, but one issue discussed in the context of critical success factors for implementation projects (Akkermans & Helden, 2002; Somers & Nelson, 2001; Sun, Yazdani, & Overend, 2005) is trust. Trust influences co-operation and commitment among actors (Rajiv, 1999; Salam, Iyer, & Srikantan, 2001), and is therefore crucial to establishing positive results during implementation (Lander, Purvis, McCray, & Leigh, 2004; Scott & Kaindl, 2000; Somers & Nelson, 2001; Wang & Chen, 2006). The presence of trust is shown to reduce project failure rates. Trust is "*important for ERP customization clients in determining their assessment of the relationship with the vendor, because the customization of such complex software typically entails vulnerability and dependence on the vendor*" (D. Gefen & Keil, 1998). Somers and Nelsen (2001) argue that "*the successful implementation of ERP systems requires a corporate culture that emphasizes the value of sharing common goals over individual pursuits and the value of trust between partners, employees, managers and corporations*". The absence of trust, or mistrust, in an implementation project typically necessitates extra effort in relationship building and increased project control through a variety of formalisms including contracts and legal remedies.

In the context of implementation of ERP systems, trust is defined as "*the belief that others on whom one depends will fulfil their expected commitments*" (David Gefen, 2004; Lander, et al., 2004; Salam, et al., 2001; Scott & Kaindl, 2000). Trust exits at three levels (Lewicki & Bunker, 1996):

1) People-based trust ("to keep one's word") where there is no developed connection, history or ties between the truster and the trusted

2) Knowledge-based trust ("based on predictability – relies on information") where there is a common history but no obvious sharing of values, e.g. when a buyer enters into an implementation project with a supplier with a good reputation.

3) Identification-based trust ("the parties effectively understand and appreciate other people's wants – act for each other") where there is a shared history and the parties are interlinked, e.g. sharing a set of technological frames (Wanda J. Orlikowski & Gash, 1994).

Lander concludes that "*development of trust at one level enables the development of trust at the next higher level; a violation of trust can also reduce the level of trust, and therefore also change the mechanisms used to develop trust*". Trust can be developed by means such as intensive communication, coaching, delegation of responsibility, personal care and attention (Jarrar, Al-Mudimigh, & Zairi, 2000). An important factor in the establishment of trust is whether the supplier acts in accordance with client expectations (David Gefen, 2002, 2004; David Gefen & Ridings, 2002). Zucker states that there are three general modes of trust creation (Zucker, 1986):

1) Process-based - where trust is created through the process itself (e.g. the supplier delivers what is expected)

2) Characteristic-based - where the actors have a shared understanding based on gender, culture, race etc. and share reference frames (Wanda J. Orlikowski & Gash, 1994).

3) Institution-based - indirectly based on formal structures such as certification, regulation or independent intermediaries, e.g. professional certifications such as PRINCE, CMMI or ITIL.

This article studies trust relationships in the context of a large scale implementation of an Integrated Healthcare Information Systems (IHIS) on the Faroe Islands. The investigation forms part of a longitudinal study of the implementation from 2005 to 2009, though the focus is here upon events that took place in 2006. At this time, the project was in considerable difficulties and trust relationships were problematic. The present article seeks to understand the trust perceptions of several of the main actors in the project, to understand how these varied during the period of study, and to suggest possible explanations for these variations. The data analysis method is content analysis (Krippendorf, 2004). The theoretical framework for trust has not previously been used in the IS field - it is based on concepts from Anthony Giddens' theory of modernity. This framework offers several advantages in the study of the dynamics of trust in implementation projects which will be discussed later.

The paper will be organized as follows. After the introduction we present the *research approach* in section two which is followed by an introduction the *conceptual foundations* on which the analysis is done in section three, the section outlines the abstract system approach and establishes an analytical framework to be applied on the case. The fourth section tells the *case* of IHIS implementation on the Faeroe Islands with focus on the depression of the project in autumn 2007. In the fifth section it is *discussed* how the concept of abstract systems can lead to further insight and propositions are given about trust aspects. The final section concludes with some implications for future IS research on the implementation of information systems and suggests further research.

2   RESEARCH APPROACH

Trust perceptions are subjective phenomena, dependent on historical and social contexts, for which interpretative studies are well suited (Walsham, 1993). According to Klein & Meyer (1999, p.67, "*interpretative research can help IS researchers to understand human thought and action in social and organisational contexts; it has the potential to produce deep insights into information systems phenomena including management of information systems development*". Interpretive researchers base their findings on their subjects' interpretations, which places additional pressure on their ability to explain in detail how results are derived (Walsham, 1995). They also need to be able to generalize those finding, since a theory that lacks generaliseability is not useful (Lee & Baskerville, 2003). Social structures (such as trust relationships) do not exist independently of the human agents that form them through their actions and interpretations, and the natural science methodological precepts of reduction, repeatability and refutation are not necessarily applicable. Walsham (1995, p.79) therefore introduces the concept of "generative mechanisms" and argues that they should be "viewed as 'tendencies'". These can be used to explain future situations, but are not fully predictive. Conceptualised in this way, *"generalizabllity need not have a quantitative or statistical dimension*" Lee & Baskerville (2003).

Data collection relied on three sources: participant observation, individual semi-structured interviews and document studies. The present analysis forms part of a longitudinal study where 17 actors, selected to represent the principle IHIS project stakeholders, were interviewed twice a year from the summer of 2005 until early 2009. All interviews were transcribed. One of the authors was the consultant to the Faroese Healthcare Minister on IS strategy and procurement of information systems from 1998 to 2004. The researcher was a non-participant observer of the system implementation, attending project meetings and significant events. Observations and semi-structured interviews were supplemented by informal social contact with the participants and review of written materials. Semi-structured interviews were conducted at all levels of the organization - with senior managers, such as the deputy minister and hospital directors, with the IHIS implementation project manager, members of the implementation group, the internal consultant, super-users and regular users. In all seventeen actors have been interviewed twice a year from spring 2004 until autumn 2008.

The present study concentrates on a sub-set of four of the principle management actors who were interviewed in 2006-7. The four actors represent the principal managers of the project, and the time segment covers a particularly difficult period in the evolution of the project, where trust relations hit a low point.

The data analysis strategy is content analysis. Content analysis is a systematic approach to qualitative data analysis that looks for structures and patterned regularities in the text (Myers, 2009, p. 257). Krippendorf (2004) defines content analysis as '*a research technique for making replicable and valid references from data to their contexts*'. To do this, the researcher first of all develops a set of categories or concepts. These codes are then related to units of text (Myers, 2009, p. 172) and inferences are made on the basis of structures and regularities. Krippendorff suggests the use of a six stage approach to content analysis, which is applied in Table 30.

content analysis stage	trust analysis
A body of text - the data that a content analyst has available to begin an analytical effort	8 transcribed semi structured interviews – four interview subjects (the deputy minister, the CIO, the project manager and a consultant doctor) interviewed at two time points: autumn 2006 and spring 2007
A research question that the analyst seeks to answer by examining the body of text	Overall research question: how does actors' trust in the project evolve during the implementation of large information systems? Sub questions: What elements constitute trust during

|	implementation? How do actors establish trust during the implementation process? How does actors' trust change during the implementation process?
A context of the analyst's choice within which to make sense of the body of text	The IHIS implementation project in the Faroe islands
An analytical construct that operationalizes what the analyst knows about the context	A framework of elements from Anthony Giddens´ theory of modernity conceptualizing trust issues. This forms the basis for the coding table.
Inferences that are intended to answer the research question, which constitute the basic accomplishment of the content analysis	Findings about the trust perceptions of the principle actors developed abductively by analyzing the coded pieces of text
Validating evidence, which is the ultimate justification of the content analysis	Thick description of context, document study, participant observation and corroborating witness testimony.

Table 30. Kripendorff's content analysis stages applied to the trust analysis

The coding table is derived from the trust framework elaborated in the next section, and attached as annex A. The eight interviews were coded independently by the 2 authors using Nvivo software. A cross-section of the interviews was coded by both authors to ensure consistency, and the coding scheme was piloted and discussed with an external reviewer. Coding strategies and evolving inferences were discussed in plenum meetings.

3   TRUST CONCEPTUALIZED THROUGH THE THEORY OF MODERNITY

When researchers in information systems have faced a need to analyse or understand the dynamic aspects of complex social systems, they have traditionally taken advantage of concepts from the social sciences. One familiar approach is Giddens´ Structuration Theory, which has been used to address the unintended consequences of actions and the relationship between agency and structure (Ngwenyama & Lee, 1997; W. J. Orlikowski & Robey, 1991; Pozzebon & Pinsonneault, 2005; Rose & Scheepers, 2001). The present study applies concepts from Giddens' later account of modernity (Giddens, 1990) (which nevertheless shares many commonalities with structuration theory) to provide insight into trust in the information systems implementation process.

Trust is a central element in Giddens' thinking about modernity. He defines it as "*confidence in the reliability of a person or system, regarding a given set of outcomes or events, where that confidence expresses a faith in the probity or love of another, or in the correctness of abstract principles "technical knowledge*" (Giddens, 1990, p33). Trust exists in an environment of socially-created transformative human activity. Human activity creates intended and unintended consequences (contingencies) and thus involves risk and danger, to which trust is a response mechanism. Trust is related to absence in time and space; the ability to have confidence even though the trusted person or social system is out of direct contact, which is also a fundamental precondition for the existence of social systems. Giddens refers to this throughout his work as *time-space distanciation*. Trust involves the attribution of probity to a person or system to act in a reliable way in relation to contingent outcomes and situations with incomplete knowledge; therefore the breakdown of trust is also a personal failure of attribution. Trust is thus implicated in social actors' *ontological security* – the concept that Giddens always uses to represent an actor's confidence in their social identity, and in their situation and how to proceed with it. Giddens distinguishes between trust in persons and trust in *abstract systems*. Abstract systems, such as legal and banking systems are combinations of technical means, procedures, professional expertise and other structures. Trust in abstract systems enables dynamism in modern societies, by allowing social actors to act with confidence in the

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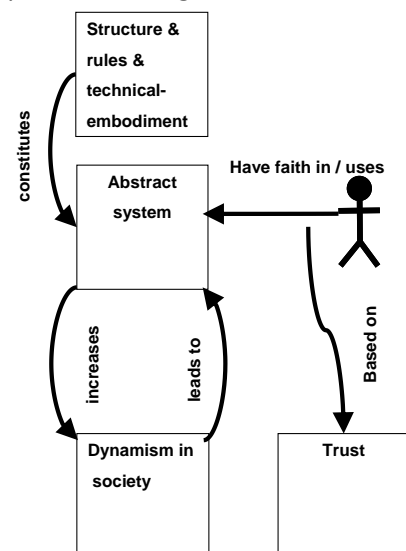
absence of personal knowledge of, or contact with the structures, actors and actions embodied in the system. Trust in abstract systems allows you to use a bank without detailed knowledge of its procedures or established relationships with its employees. Abstract systems are thus *dis-embedding* mechanisms – enabling time-space distanciation and providing security and guarantees to their users. An abstract system is a means to stabilise relations across time and space - '*something to trust in*' (Walsham, 1998).

Dis-embedding is the process of lifting social relations away from a local interaction context and reconstructing them across intervals of time and distance. Dis-embedding is dependent upon trust - the actors involved must believe that the social relation will endure at a later time and different place. The bank customer must believe that they can reclaim their money in a different branch at a later date or they will not deposit it. Giddens specifies two types of dis-embedding mechanisms, *symbolic tokens* (such as money) and *expert systems* - collections of practices, procedures, expertise and technologies. Abstract systems employ both mechanisms. A dis-embedded social relation can be *re-embedded* – that is, it can again become localised, personal and immediate, however temporarily. A bank customer may take a meeting with his adviser to discuss a difficult transaction. The adviser represents the expert abstract system, and such re-embedding is important for the maintenance and re-establishment of the trust relationship between lay person and expert system. Places where lay actors meet and interact with the expert system

Figure 81: An abstract system

are termed a*ccess points* by Giddens. Access points are described by Giddens in terms of two forms of commitment – *facework commitment* and *faceless commitment.* Facework refers to interactions in co-presence, such as the meeting with the bank adviser, where the expert representative can be expected to exhibit a professional and trustworthy demeanour. Faceless commitment describes non-personal forms of interaction at access points, such as a withdrawal from an automatic cash dispenser. Re-embedding and facework and faceless commitments are made necessary by our modern habit of *chronic reflexion,* where reflective evaluation of our situation, our actions and their consequences is a constant feature of our social practice. This implies that trust in persons or abstract systems can never be absolute or constant over time, but must be periodically re-confirmed.
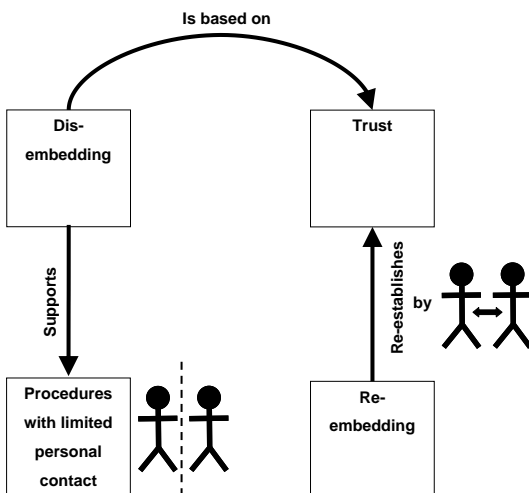

Figure 82: Dis- and re-embedding

Trust in abstract systems produces dynamism in society by allowing actors to proceed in situations of uncertainty - freeing (mental) resources and enabling social interactions across time and space. The absence of such trust forces social actors to take many actions to reduce risk and uncertainty, to control situations by face to face interactions and confidence building measures, and to set in place procedures and regulations to govern social interactions.

To summarize, the principle analytical concepts used in this article are:
- Trust – in persons and in abstract systems
- Time-Space distanciation – the ability of a social system to function over time and space without the physical co-presence of its social actors, sustained by trust
- Abstract system – expert system trusted despite lack of detailed understanding or personal trust relations
- Dis-embedding, re-embedding – processes where an abstract system is removed from immediate close contact, and temporarily made personal again
- Access point – a point where a lay person makes contact with the abstract system

- Chronic reflexion – constant evaluation of our social situation and actions (including the trustworthiness of people and abstract systems)
- Ontological security - confidence in the robustness and sustainability of self-identity and belief in the continuity of social practice, sustained by trust in people and abstract systems.

As seen in the introduction trust is an important aspect in IS implementation and the implementation processes is an example of dis-embedding. By introducing the information system in the clinical social system, social relations are lifted away from the local interaction context, e.g. by letting an employee order spare parts from the stock using the system's "order-module" instead of having to go there her self with an order form. This is only possible, because the employee (the user) trusts that the procedures will work. In line with this, trust can be re-established during the process of re-embedding which is when employees meet face to face and appreciate the quality (the pleasure) of personal interaction. During implementation of the new ERP system such personal interaction happens during project meetings or just normal visits at each other's offices. An example of chronic reflection is the ongoing self-reflection an actor has during the implementation of ERP-systems and which can alter the original intentions (Baalen & Fenema, 2005).

4   THE IMPLEMENTATION: IHIS IN THE FAROE ISLANDS

The Faroe Islands are a self-governing part of the Danish National Community with 48,000 inhabitants distributed across eighteen small islands. They lie in the North Atlantic Ocean between the Shetlands and Iceland with one third of the inhabitants living in the capital, Torshavn. Three hospitals and twenty-seven general practitioners (GPs) report to the ministry of health. General practitioners are in principle self-employed, but work in clinics supplied by the local authorities. They invoice the private sickness benefit associations and co-operate with the hospitals. Discussions about establishing an integrated healthcare information system, with the purpose of modernizing and integrating all parts of the Faroese healthcare system, began in 2000. After feasibility studies and planning, a contract was signed on 3rd November 2004 with a supplier. The scope of the implementation project was to implement a shared integrated health care information system at the three Faroese hospitals (more than 200 users) and at all general practitioners. The contract also included licenses for users working with home and elderly care. The implementation project is one of the largest IT projects in the Faroese public sector ever, involving the complete health care system throughout the community. Implementation commenced in January 2005, and was planned to be finished at the end of 2006; however the project ran into difficulties. In December 2008 the ministry extended the project by at least two more years. Technology competence in the Faroe Islands is a scarce resource, and the ministry is dependent on external consultants, both for day-to-day issues like maintaining the existing infrastructure and also for delivering more tactical and strategic advice. They contracted an external consultant as project manager and in mid-2005 recruited a Chief Information Officer (CIO).

The main difficulties meet during the implementation was related to issues such as a general lack of workforce, the standard IHIS lack of correspondence to work practices in the clinical systems at the Faroe Islands and problems to integrate the many groups of staff involved into one coherent project organisation.

Under the guidance of the supplier's project manager, the core system was finally configured during the spring. Isolated wards of the national hospital took the system into use during the summer of 2007, and a major roll-out planned. In the second half of the year the surgical ward succeeded in configuring parts of the system to their needs. The pilot wards continued their use of the system, but without integration with the remaining wards. However the system did become more stable. In early 2007 it was decided to implement the IHIS in the emergency room at the National Hospital, where all GPs in greater Torshavn take shifts during night-time. This led to five more GPs deciding to adopt the system in their own surgeries. To further support the diffusion among GPs, the project management visited the local authorities in the municipality to present and discuss the system. At this point the end users were very happy and began to

trust that the project would lead to something useful. They also saw that the supplier could implement a solution for the privacy issue. The GPs encountered an adapted IHIS at the emergency room, and many GPs began to understand the use of the system and trust that they themselves could benefit from it.

In September 2007 the core system was formally taken over by the Faroese Healthcare Authorities and a party for all actors was arranged to celebrate this major achievement. In 2007 the ministry bought a laboratory information system, a blood bank system and a digital x-ray system to be installed at the national hospital and to be integrated with the IHIS system. When management recognized the progress with GPs' trust in the project, and the end users' generally increased trust in the configuration progress, they decided to formally accept delivery of the IHIS from the supplier. Trust had returned and was celebrated with a huge party.

In the autumn 2007 the project organization began to collapse. The workload to finalise the (local) configuration of the IHIS was heavy, the money for compensating staff from the wards for taking part in the local configuration was used up, and the centrally placed IHIS coordinators (e.g. nurses assigned full-time to the project) felt squeezed between demands from the wards and loyalty to the implementation project. This led to conflicts between local staff and central project management. Staff from the surgical ward began to resign from the project, and the ward decided that the IHIS could not be used in its present configuration. Just before Christmas the project manager from the ministry also resigned, blaming the high workload and the level of conflict. The project was again in deep and serious trouble. After a period with a high level of trust, many end users lost confidence in the project (and their own roles within it).

Staff problems during the autumn and the resignation of the project manager led, in late 2007, to a huge crisis in the management group's belief in the future of the project - an all time low level of trust in the project.

5   ANALYSIS

During the discussion we will describe the 3 major abstract systems in play in the case, argue that ontological security as such deteriorated in the period of time in question and show how this deterioration can be explained through analytical lens of trust and theory of modernity.

5.1   Abstract systems: Clinical, Regulative, Technical

In our analysis, the implementation project had to interact with three principal abstract systems (AS):

The clinical AS (various types of medical practitioners: doctors (consultants, general practitioners) and nurses, with different specializations and expertise (surgery, physiotherapy, pathology, psychiatry). It is served by many supporting services of an administrative character, such as secretaries maintaining medical records. Principal focus: patient care.

- The regulative AS (managers and administrators, civil servants, politicians, regulatory bodies such as the data protection authorities). Principal focus: resource distribution, administrative regulation, political accountability.
- The technical AS (suppliers, system developers, programmers, system administrators). Principal focus: technical system engineering, programming, system development
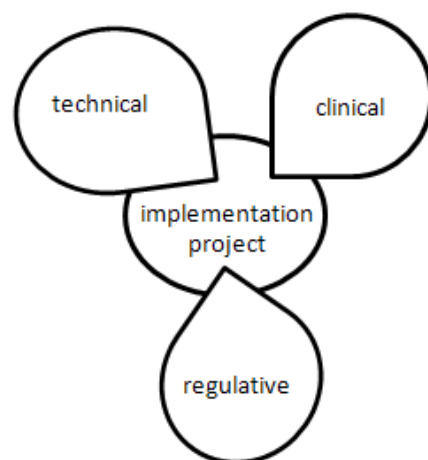
Figure 83: the interacting abstract systems

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The IHIS is designed principally a technical means of supporting the clinical AS. When implemented it is intended to

> "integrate clinicians' daily routines.......making internal communication possible.......a place to store their information and retrieve the information in the system" (CIO 33).

Thus it increases the time space distanciation of the clinical AS. A principal objective is to increase patients' trust in the clinical AS by giving them a more integrated experience:

> "a connected integrated solution for the health service, so the health service can be experienced as a joined-up whole" (CIO 33).

A further role for the IHIS is the provision of analytical data for the regulative AS –

> "the political system will certainly request information from the system – output from the system" (CIO 33).

Part of the project team's job is to act as intermediaries between the three expert AS's – to develop and maintain trust between the various expert representatives, and to develop and maintain trust in a fourth abstract system, the project itself. The project manager explains this in terms of her various responsibilities:

> "as I see it I have three roles. On the one hand I'm the general project manager, which means that I have responsibility for everything to do with software releases from the supplier.............I'm also involved with the project's financial side...........I feel I'm also ultimately responsible in this area. ....Moreover I am responsible for the system.........for how the system can and should be configured..........that the system is set up correctly and default values chosen. These decisions need a good understanding of the system's functionality ....and of work practices – how the users work with it" (PM26).

Her first responsibility is as intermediary with the technical AS, the suppliers, the financial responsibility is primarily a relation with the regulative AS (where the abstract system tokens are money), and the third responsibility is to the clinical AS.

The implementation team cannot acquire a complete understanding of any of the AS's that they must interact with; they therefore facilitate various interactions between representatives of the different AS's. An important interaction that must be facilitated is configuration. Here experts from the technical AS who understand how the IHIS is designed enter into dialogue with expert representatives from the clinical AS to discuss how the standardised system should be adapted to fit practitioners' clinical needs. The project manager acts as the person with some knowledge of both sides – the intermediary. It is a complex system and there are many different clinical practices, so this task is bound to be exhausting. Nor is there necessarily much agreement between different representatives of different parts of the clinical AS over what is important:

> "general practitioners are very focused on their everyday concerns – their patient records, invoicing, patients' growth patterns......e-prescriptions and on-line connections to health insurance funds. Here in the hospitals I notice that it is the more traditional things that surface, concerning medical records and drug regimes" (CIO 29).

The team function as access points between the three AS's, in a constant process of dis-embedding and re-embedding, in their intermediary roles. Confidence in all three AS's must be maintained, as in the project, in the absence of full and complete knowledge. The regulative AS must understand that the large investment made on behalf of society is used wisely. The clinical AS must understand that their commitment will eventually result in better patient care. The technical AS must undertake relatively large adjustments to the IHIS to make it fit the Faroese context. The large investment of human and material resources depends on a mutual trust in the outcome.

As confidence in the project begins to fade, the project manager switches consciously to facework commitments:

> "Special treatment means I need to go to them now and work on their attitudes, talk things through, tell them what's happening and get them to think positively instead of negatively. It's vital I get a dialogue started with them because we can't get anywhere whilst they stand in our way – that's what they're doing" (PM 31).

5.2 Deteriorating ontological security

Ontological security refers, in Giddens' theories, to confidence in the robustness and sustainability of self-identity and belief in the continuity of social practice, sustained by trust in people and abstract systems. In this analysis we investigate the ontological security of the project team's principle actors by assessing their attitudes towards the project and their roles in it over the study period. Both quantitative and qualitative content analysis is used. Interview statements at the two interview points concerning the project's status and expectations were coded as positive or negative, and both counted and cross-tabulated with Giddens' trust concepts.

In the period from autumn 2006 until spring 2007, negative statements from the management group (CIO, PM and DM) regarding their belief in the successful completion of the project increased significantly (from 40 to 58), whereas positive statements decreased (from 21 to 10).

The project manager (PM), has many concerns with the project, her team and the management group, and displays a high degree of reflexive thinking, with many judgments about the various issues that concern her (chronic reflection). Statements which can be directly associated with insecurity in her ontological security more than double between the two interview points.

At the first interview point, the major ontological concerns of the actors are related to two factors. The first is their ability to meet the work demands:

> "in reality I'm responsible for the whole system configuration and to a certain extent, also do it myself......and I want to be involved, but I can see that I can't manage everything................and many things go wrong. Then there's the supplier problem list……..then there's the system manager role...and then there's the rollout manager role" "the many preparatory tasks ….don't get further than being specified, and they're never really completed. That's because of bad management in the project team – it's a problem" (PM26).

The second factor is the self-evaluation of the quality of their work:

> "I spent my weekend philosophising on my three roles...and I think I perform all three badly because I can't find time for everything" (PM26).

Six months later, both the volume of concerns and their nature have changed as the project shows signs of breaking down. They still have concerns about the size of their workload and the quality of their work:

> "there are far too many operational tasks in my work today – so many that they overshadow my project management.....and i think myself that my project management is getting worse. I don't really have time to focus on what I think is most important – realising the project" (PM31).

This observation is backed up by intense discussions in the steering committee as seen in the resumes of the meeting in this period of time.

However they also feel that their qualifications and judgments are viewed with suspicion by the clinical professionals they work with:

> "there's an impression that it's the health department's project and they're forcing it though…. The consultants are in principle autonomous…they think it's something they should decide……not the

health department" (PM31). "we use our energy rebuilding trust all the time because it's constantly undermined... the strange thing is that it's undermined by people who don't really use the system. ...the people that have been using it for a while trust it" (PM31).

The team is de-motivated:

"they're constantly assumed to be stupid......not to know what's it's really about......its really hard for them" (PM31).

Mistrust has consequences both for ontological security and on the ability to act to rescue the situation:

" it's hard to have the confidence to try things out if you're always being told you don't know what you're doing....then your self confidence is undermined and it's hard to take the next step".

Both quantitative and qualitative analyses reveal a picture of deteriorating confidence in the project, both internally and externally. The project team's ontological security is maintained by trust exhibited by others, both other team members and by the experts representing the other abstract systems. In the absence of perfect knowledge of the workings of other abstract systems, trust is extremely important in maintaining their interactions. The team's ontological security is sustained by trust – as this begins to waver, their confidence in their own abilities also declines. The PM shares more of this chronic reflection with the interviewer than the other team members. A particular serious consequence of the breakdown of ontological security is its effect on the team's ability to act to solve its perceived problems. Poor self-confidence leads to caution in finding and applying remedies.

The project manager is particularly hard hit by declining trust and confidence, and resigns shortly after the second interview point, with serious further consequences for the project.

5.3   Explanations of deteriorating ontological security

Ontological security is confidence in the robustness and sustainability of self-identity and belief in the continuity of social practice, sustained by trust in people and abstract systems. Giddens states that trust in abstract systems cannot replace intimacy offered by personal relations, and dependence on abstract systems in modernity therefore introduces a new form of psychological vulnerability (Giddens, 1990). An explanation for deteriorating trust and ontological security in the implementation project can therefore be the complexity and resource demands of continuous dis-embedding and re-embedding mechanisms in interactions with three different abstract systems (clinical, regulative, technical).

The case provides many examples supporting this claim. The lack of proper dis-embedding is addressed by the CIO who addresses the problematic interlinking between the project and parts of the regulative and clinical abstract systems:

"the biggest problem we have is that there is an overall organisation that has to manage things for quite a lot of other units....there's one organisation that runs the project and another that implements it.............there's a lack of ownership and commitment" (CIO33).

The project manager is clearly overwhelmed by the extent of the dis- and re-embedding work involved in her three different roles 8see above). The deputy minister's solution is that formal daily dis-embedding mechanisms should be introduced:

"I want to have a steering group meeting every month...............it gives an impression that we have things better under control" (DM28).

The lack of proper re-embedding mechanisms is recognised by the management team in their reflections about the lack of co- presence ("facework commitments") during the project:

"my rollout role is difficult to carry out when I'm located in a different place than the team.....it means there's practically no progress in the project team" ...." I can't really function as the overall

project manager without contact with the CIO, or the steering committee. If I'm in the hospital, that's fine, I can at least manage the rollout, but I can't be the overall project manager in the health department.....................but if I'm not here at the health department then I think the overall project management will suffer" (PM26).

When the management group actually enters info facework commitment, re-embedding takes place:

"we've had a lot of problems clearing up relationships in the contract.................so we chose to hold a meeting with the suppliers, where we also brought in our lawyer............do we stick to the contract or don't we?......they also had some demands..........is it reasonable or isn't it............we cleared the air and got things moving again (DM26)".

Co-presence is also found important in the operational work, in the technical AS:

"they got a chance to try the system out themselves...........it was a real breakthrough" (CIO29)

, and in the clinical AS;

"we lack managers that turn up and say that's the way it ought to be.............if Anne or the girls in the team say that's the way it ought to be – then that's what we do......we don't really get that here" (PM31).

The analysis points to considerable complexity for the project team in managing dis- and re-embedding processes in relation to the regulative, clinical and technical AS's. The facework commitments and co-present situations are shown to be missed if they are absent, and important for re-establishing trust. They also consume many resources. Difficulties in managing these relationships are implicated in trust failures and in deteriorating ontological security.

6   CONCLUSIONS, IMPLICATIONS AND FURTHER RESEARCH

In this article we investigated the implementation of an integrated healthcare information system in the Faroe Islands. We focused on trust, using an analytical framework based on Giddens' theory of Modernity. In the study period we could observe a serious deterioration in trust in the project, and in the ontological security of at least one of the principle actors. This deterioration is caused by previous events and relationships in the implementation, but also has serious consequences for it- a dynamic process. We also establish that the project must interact with three complex abstract systems and that this complexity is implicated in declining trust levels. The interaction is dependent upon trust and upon the dis-embedding and re-embedding mechanisms that Giddens' describes. Actors' ontological security and trust in the abstract systems they interact with go hand in hand; when the PM's self-confidence disappears she becomes suspicious about the actions and motives of clinicians and administrators, and loses faith with the eventual outcome of the project. Ontological insecurity, mistrust in personal relations and lack of confidence in future outcomes are not pleasant to live with, provoke a negative reflective spiral, difficulties in deciding how to address problems and extra work on top of already overloaded work schedules. In this case the project manager resigned – presenting an already problematic project with a further crisis.

We make the following conclusions which are supported by our analysis.
- If an implementation project interacts with many or complex abstract systems the managers must focus on continuous embedding and re-embedding by interacting directly with representatives of the abstract systems in question.
- Facework interactions can be re-established by re-embedding trust-related procedures through.
- Perceptions of trust relations influence future actions, and in this way have both negative and positive consequences.

We also conclude that Giddens' theories of trust provide a promising insight into the dynamic aspects of trust relations in implementation projects, which go further than trust theories currently used in the IS

field. They also provide an extended language that can be used to analyse perceptions of trust and their implications, and eventually to provide theoretical descriptions of trust issues and guidance for practitioners in these difficult situations.

Future research will systematically extend the analysis over the complete duration of the project and all the participants interviewed. We expect that Giddens' theories can be adapted to describe specific aspects of enterprise system implementation, including the study of the information system artefact itself and its part in the dynamic evolution of trust. This work can use earlier adaptations of structuration theory as a model. We also expect to investigate causal relationships in the evolution of trust, and to translate our findings into practice related guidance for project teams.

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- (PM26): Interview with the project manager, 29th November 2006
- (PM31): Interview with the project manager, 22nd June 2006
- (DM28): Interview with the deputy minister/head of steering.com, 29th November 2006
- (DM32): Interview with the deputy minister/head of steering com, 23rd June 2007
- (CIO29): Interview with the chief information officer in the Ministry, 29th November 2006
- (CIO33): Interview with the chief information officer in the Ministry, 27th June 2007

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Appendix A: Coding scheme, 7 features of trust, related to the PROJECT as such

Concept	Intermediate	Final search terms
Time-Space distanciation	It refers to a situation – or a quality of a social system – where we as actors can act without being physically present in the situation. It is a condition on which time and spare are organized in such a way that presence and absence is connected	Time-space Work at distance No presence, absence Time
Dis- and re-embedding	A dis-embedded system is a social system, where one or more conditions of time-space distanciation exists; this is a system that functions even though the actors are not present and where traditional face to face interactions are done automatically or by experts with no direct interaction with the clients. Dis-embedding is based on trust and supports the establishment of procedures with lesser personal contact According to Giddens two types of dis-embedding mechanisms exist: the _creation of symbolic tokens_ and the _establishment_ of _expert systems_. Re-embedding is a process where, or a situation in which, trust in abstract systems is connected to the reflexive nature of such systems, and at the same it is a process that provides meeting and actions which sustains trustworthiness among actors - re-embedding is a process in which trust is re-established during	Dis-embedding Creation of symbolic tokens Establishment of expert systems Support lesser personal contact Re-embedding Personal interaction that creates trust Personal interaction that strengthen trust Meetings Project-meetings Training

	personal interaction.	
Abstract system	Giddens provides two examples of abstract systems: The a) <u>symbolic tokens</u> of media of exchange, e.g. money, and b) <u>expert systems</u> enabling complex systems to work, e.g. transport systems. The first type - symbolic tokens - is a medium that can be passed around among actors and groups of actors; where these groups can act on the basis of these media in principle without taking into consideration the specific characteristics of that group. A good example of this – and the only provided by Giddens – is *money*. The other type of abstract systems is the so-called *expert system* which is a system based on, or built of, a combination of technical means, procedures, professional expertise and other structures. Giddens gives the following definition: "*systems of technical accomplishment or professional expertise that organize large areas of the material and social environments in which we live today*". Abstract Systems, which are characterized by the fact that even without concrete and detailed knowledge about them, we, as actors, are able to apply them anyhow.	Abstract system Symbolic tokens Media passed around Expert systems Technical based Organising large area Social environment Used /applied by actors
Access point	Access points are where actors actually meet and interact with the expert system. They are points, where lay persons connect with representatives of this abstract system. Two ways to use the access point: face-less (the actors do not meet a real person representing the system) or a face-work (the actors meet a real, living person, an expert). An access point has two 'parts/faces': one towards the actor ('front stage') and one towards the system ('backstage') and the expert behaves differently in the two roles/situations.	Access point Face-less Use of system pc Correspondence / mail Face-work Telephone, meeting, help, service, communication
Chronic reflexion	Relate our actions with thoughts on who we are and why we are doing what we are doing.	1) The respondent reflects about a given situation or incident
Ontological security	The term itself has reference to the confidence that the majority of people have in the robustness and sustainability of their self-identity and their belief in the continuity of the social practices of which they are part.	1) The respondent expresses something about confidence in the continuity of the processes or organisation or…
Negative	We are counting statements where the interviewed direct, or in-directs, express a positive or negative attitude /trust in the finalisation, or aspects of it, of the implementation project. Two or more statements origination in the same event or status will only be counted once.	Negative
Positive		Positive

Coding of positive and negative positions towards the implementation project:

	Ann (Project Manager)	Nicolai (CIO)	Poul Geert (Dep.Min.)	Summed up
Autumn 2006	-25+8= -17	-17+4= -13	-8+9= +1	-50+21=-29
Spring 2007	-32+3= -29	-18+6=-12	-8+1= -7	-58+10=-48