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“I Wouldn’t Go Back to the Old System”: A Technology Laggard Organization, Resistant Users And System Implementation

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Abstract

Mobile system implementation in a technology laggard organisation with resistant users might not sound like a good idea. Prior literature on user resistance has concentrated on failures, reasons behind the resistance and management strategies for decreasing resistance. This paper provides a view on successful system implementation, and most notably describes in detail how the different strategies affected the resistance during the process.

Keywords: User resistance, system implementation, success, resistance management activities, longitudinal interpretative case study

1 Introduction

Mobile system implementation in a technology laggard organization with resistant users might not sound like a good idea. Local government authorities in two small towns, the managers and workers in both towns were all female, their mean age was over 53 years, and most of them were resistant to ICT. However, the system implementation became a success, against all odds. How did they do it?

Prior literature on user resistance has concentrated on failures, reasons behind the resistance and management strategies for decreasing resistance (Jiang, Muhanna, & Klein, 2000; Klaus, Wingreen, & Blanton, 2010). In addition to user resistance literature, we also examined the general management strategies from system implementation literature. This paper shows how incentives, training, external change agents and most importantly, managers, can decrease the user resistance and system implementation can succeed.

The research question of this paper is: how do the different management strategies decrease user resistance and facilitate information systems implementation? The research problem was examined by means of a longitudinal case study that used

qualitative interviews, the transcriptions of meetings, observation notes and the answers given to the open-ended questions of a survey.

Interviews and other material clearly identified the importance of incentive alignment, training and external change agents as well as management involvement influencing the success. This paper provides a view on successful system implementation, and most notably describes in detail how the different management strategies affected the resistance during the process. However, this is only one study and further research is needed on the effects of management strategies with different kinds of systems.

2 Theoretical background

2.1 User resistance

Rogers' (1983) diffusion of innovation theory defines "laggards" as the last individuals to adopt an innovation, sometimes adopting it after an alternative one has entered the market. Laggards often continue the work traditions and methods of previous work generations, but when forced to adopt new methods they have to be certain that their investment is not wasted because they usually have limited resources (*ibid*). They persist with old habits, "we have done this always in that way", and are reluctant to change until it really is an absolute necessity and obviously worth the effort and money. In other words, they are change resistant.

Resistant users are closely related to technology laggards, as they want to continue as they were (Laumer & Eckhardt, 2010). An example of this comes from a doctor who expressed his fear of losing his expert status when a new electronic patient record system was implemented by saying: "We are craftsmen. We need a hammer and a chisel to do our job. This [using a computer] is not really of interest to us." (see Jensen, Kjaergaard, & Svejvig, 2009).

The research on user resistance is categorized as people-oriented, system-oriented and interaction between the system and people (Jiang et al., 2000; Markus, 1983). According to them, people-oriented resistance is considered to originate from the users themselves (Shang & Su, 2004); system-oriented refers to complex systems, which might be difficult to use (see Klaus, 2005); and the interaction theories focus on the interaction of the people and the system (Kim & Kankanhalli, 2009). In people-oriented view, for instance gender, age and attitude such as cynicism (Selander & Henfridsson, 2011) are seen relevant.

Lapointe and Rivard (2005) have studied resistance behavior after electronic medical record system implementation, when users may eventually actively and even aggressively resist the system and cause implementation failure. It has been found that the main reasons behind user resistance include change in job content, uncertainty, loss of status (Jiang et al., 2000; Lapointe & Rivard, 2005), an increased workload, technical problems, complexity, lack of fit, (Klaus et al., 2010), habits and perceived risks (Aladwani, 2001; Kim & Kankanhalli, 2009), change resistance (Laumer & Eckhardt, 2010).

2.2 Strategies to decrease user resistance and succeed in system implementation

There are a number of strategies for managers to help users, who are resisting technological changes (Klaus, 2005). Klaus et al. (2010) discovered that users wanted managers to present a clear implementation plan, show their expertise and communicate, for example, the expected changes. According to Aladwani (2001) active management support can also ease user resistance, but passive strategies also seem to work in some cases (Meissonier & Houzé, 2010). Jiang et al. (2000) found that participative strategies (such as allowing users to participate in implementation and launching a help desk) and user training were appropriate ways of reducing the anxiety of users about change. Nevertheless, even if the users do resist change, an information system implementation has a greater chance of success if management is active and facilitates implementation.

Effective strategies for relieving user resistance are thus e.g. management support, user participation and training. Many academics recommend user participation in information system development as an effective practice in order to achieve various favorable outcomes, such as user satisfaction and increased system quality (Barki & Hartwick, 1994; Ives & Olson, 1984; Markus & Mao, 2004). Hartwick and Barki (1994) suggest that users who are engaged in participative activities during information system development usually regard the system as being good, important and personally relevant. There is a connection to user resistance: if users want to know how their jobs or statuses are going to change and the benefits of the system, participating in the development phase is one strategy that can help reduce resistance towards change.

Sabherwal et al. (2006) discovered that training affects user perception of a system’s quality and, as such, it may be a good long-term investment for increasing system use. However, despite the large investments, implementation expectations are frequently not met (Compeau, Olfman, Sei, & Webster, 1995; Sharma & Yetton, 2007). Training helps when users are afraid they cannot learn or control the system, it is considered complex, or there are likely to be some technical problems that cannot be easily avoided.

Venkatesh and Bala (2008) have presented also other activities useful in system implementations, for example design characteristics, incentive alignment, organisational and peer support.

Many studies have found system *design characteristics* positively affect user acceptance and system success (Davis, 1989; Venkatesh, Morris, Davis, & Davis, 2003). If the system is user friendly, users may feel that they have more control over the system, which enhances their comfort and skills i.e. self-efficacy (Compeau & Higgins, 1995). Complex systems and technical problems increase user resistance, so the design characteristics of the system are significant, particularly with resistant users.

According to Ba et al. (2001), a system is *incentive aligned*, when it has embedded features that induce users to employ the system in a way that is consistent with system’s design objective and the organization’s goals. Very attractive incentives might also have influence on user resistance; a user may become interested in using the system if the incentive is high enough. Although the effect might be temporary (Lin, 2007), if the

reason behind the resistance is, for example, a lack of computer self-efficacy, gaining more experience should increase their comfort and skills with the system, after which their resistance should decrease.

Organizational support can be either informal or formal activities or functions which help employees use a new system effectively (Venkatesh and Bala, 2008). Facilitating conditions may also be considered part of organizational support, such as knowledge, equipment etc. User resistance can be eased with organizational support, for example, a help desk to assist users with technical problems (Lee, Lee, Olson, & Chung, 2010; Lee, Kim, Rhee, & Trimi, 2006). In technology laggard organizations, the expertise of the IT department is also of key importance in the acquisition and contract stage.

Eckhardt, Laumer, and Weitzel (2009) discovered that *peer support* was stronger for the non-adopters of a system, which could be interpreted as indicating that key influencers in an organization may also be barriers to implementation. Therefore, they also emphasised the importance of engaging key opinion leaders in the implementation process; if key persons positively influence their peers, user resistance might be decreased.

3 Methodology

This study uses interpretative case research methodology, since we are studying a complex real-life phenomenon – the implementation of a mobile system in two organizations – which requires a thorough interpretation of the process from start to end (Klein & Myers, 1999; Yin, 1984). We furthermore had access to vast amounts of data, based on a 4-year collaboration with the studied organizations, which allows us to find “contribution of rich insight” (Walsham, 1995) and explanations on how did the activities affect system implementation. In this paper, the theory has been used iteratively as part of data collection and analysis (Eisenhardt, 1989; Walsham, 1995), and due to the longitudinal nature of the study, many theories have been abandoned.

Town A and Town B are small towns in South-West Finland, both of which had approximately 16,000 inhabitants in 2009. The case organizations described in the paper have the same function, which is operating and managing family day care. Both of the towns’ administrative clerks and managers use the same software for administrative tasks such as billing, and calculating salaries. However, the data for the administrative software in these early childhood education (ECE) organizations was usually gathered manually and involved dozens of forms that were filled-in manually by day care teachers, professionals, parents and administrative clerks.

Both organizations had a complicated manual system for specific data gathering purposes before adopting a new, simple mobile system. The interface of the mobile system was a simple four-step “choose option and validate” interface, although it differed in its basic SMS and call functionalities, which many of the users were familiar with. At the time of implementation in 2009 Town A had 29 FDC workers and two FDC managers and Town B had 45 workers and three managers. The workers in both towns were all female, their mean age was over 53 years, and four of them had no prior experience with mobile phones and many of them had not used computers or the Internet before.

The data used in this article consists of several sources, namely tape recordings of 15 planning and steering group meetings, field observation notes and 6 interviews of managers and workers. The meetings were even more useful in interpreting the social situation than in the interviews, due to the interactive nature of them. From these sources – recordings, written notes and interviews – the role of the activities was discovered by use of triangulation. The triangulation process began by first listening to the recordings of the meetings, and the recordings were then compared to the written notes provided by the Ph.D. student. Then the recordings were transcribed in order to discover the role of the activities and compare them against the interview transcripts. In order to improve the reliability and validity of the analysis, we have verified our interpretations with the researchers who participated in both stages of the research project and asked for clarifying questions at the evaluation meeting with practitioners. The author did not participate in the actual implementation, but was merely an external evaluator, who participated in the evaluation meeting and formulated the interview themes.

4 Findings and discussion

4.1 Initial state

ECE directors, managers and administrative clerks used administrative information systems, which were mostly adopted based on the requirements of the central administration. The researchers also found out that there were several routine data gathering tasks done manually by, for example, family day-care (FDC) workers, which could be automated with technology in order to save time and effort. In addition, they discovered that for the past two decades ECE had suffered from severe cost cutting and been the subject of effectiveness projects, in which the number of educators in relation to children has been reduced. The remaining workers, managers and ECE directors did not have any time left to reorganize or develop their work because taking care of the children or handling everyday management problems, like reporting, had become too demanding.

These aspects are very similar to the characteristics of technology laggard organizations. The ECE organizations used old technology, which they had adopted when forced to (Ino & Kawamori, 2008; Kamal & Themistocleous, 2009). They had very limited resources and no resources for R&D (Belderbos, Lykogianni, & Veugelers, 2008; Rogers, 1983), their management did not support IT and they did not have time for the development of the organization either (Jarvenpaa & Ives, 1991) as they also had to fulfill bureaucratic requirements by reporting (Senyucel, 2008). Therefore, we can conclude that the ECE organizations studied were technology laggard organizations.

When the research project began the researchers realized that most of the ECE managers and professionals resisted ICT, although the ECE directors understood the potential of ICT. The ECE professionals constantly emphasized that they were carers; they wanted to work with children, they were concerned with pedagogy and matters of education not with technology. They immediately saw the worst case scenario when discussing the possibilities of using ICT. For example e-mail conversations with parents

were seen as “horrible,” particularly because they required much more time than ordinary face-to-face or telephone conversations.

“...’Bing’ first comes a message and then ‘Bing’ another message. No, I can’t follow messages all the time. [Pretending to read a message from a parent:] ‘Now Matt will be picked up two hours later’... No, we must have that information on the phone immediately.”

Some suggestions for automating routine tasks were seen as increasing uncertainty, as in the quotation above. They also recognized the technical and complexity problems that might occur:

”We would have to enter the attendance times of all 140 children on a computer every day, which is difficult since they change every day – even quite radically. [...] Which would mean that everyone has to have access rights to the Administrative System to be able to enter times. That wouldn’t work for us. There are only access rights for one teacher per group and she is not always available.”

These quotes show the degree of user resistance at the beginning of the research project. They did not want to change anything: their job content or habits, they were afraid of an increased workload and the perceived uncertainty and risks as well as technical problems (Aladwani, 2001; Jiang et al., 2000; Klaus et al., 2010; Laumer and Eckhardt, 2010).

4.2 Pre-implementation process: the resistant middle-managers

The most time-consuming process, which could be improved with technology, was found to be in family day care, where the arrival and departure times of children were manually written in forms, and entered in an information system by the manager of the FDC and an administrative clerk. In winter 2006-2007, Town A and Town B identified this process for automation by use of a mobile system and began implementing the system. The activities and phases of the process are described in tables 1 and 2.

In the pre-implementation phase, the directors and managers were involved. Although the directors of ECE in Town A and Town B decided that developing a mobile system for calculating FDC time would be beneficial, the managers were resistant. The managers had been previously involved in several projects, in which the benefit had not been realized, and they expected this implementation to be similar. In these organizations, users were not included in the pre-implementation phase, but managers were representing the users and thus their resistance had to be changed. Until the director of ECE came to express *management support* by participating in the meeting

Table 1. Pre-implementation activities of the system and the effect on user resistance.

Activity	Action	Effect on user resistance	Example quote * / observation note
Management support 1	Directors reserved financial resources for the project, appointed a planning group and managers as members.	Managers thought the planning group was just increasing their workload, without any benefits.	* “Well, I was against it [the mobile system] back then actually, just on principle. [...] maybe it was not even clear for us what it means. They [top management] just told us, that we are participating in this research project and it is some project which uses information technology.”
Management support 2	Director attended planning group meeting , set schedules and encouraged managers to contact IT experts.	Managers in the planning group understood the importance of the project and started to plan the implementation.	* “Now that we have heard the benefits once more, we would like to see the application, how does it actually work. ” * (After the director set the schedule:) “We thought that the [purchasing] decisions should be made before summer holidays.“
Organisational support 1 /Ext. change agent	IT experts were appointed to the planning group.	Clarified anxieties of the managers in the planning group.	* “We got this ICT expert to [this work group] and she was really positive and promised that everything will work out. She promised a lot, but I felt really relieved. ”
Design characteristics/ Ext. change agent	Sales representative and experienced user presented the design characteristics of the system in the planning group.	Managers understood that the system was not complicated and anxieties were cleared.	* ”I understood this, when the representative came to visit.” * ”We finally realized [how the system works], when the experienced user came from Town C. After that, we were anxious to get [the system], ‘do we have to really wait a year for this?’”
Incentive alignment 1	Mobile phone models were tested in the planning group.	Managers became excited and planning of the implementation advanced rapidly.	“When we started to talk about the mobile phone things started happening. They were really excited about being able to influence the choice of the device.” (observation note)

and saying she “*had great interest in the project*” and setting schedules, the process did not start fully. Thus merely appointing the task to the managers was not sufficiently convincing means to express managerial support, but the director had to set objectives and show benefits for increased workload in the long run, as Klaus et al. (2010) suggested.

External change agents such as the IT experts, sales representative of the system provider company as well as prior users of the system in another town were also useful in relieving the anxieties for technical problems, lack of fit and other risks like a change in the job content and thus also management resistance. Especially the experiences of peers in the near-by town were appreciated, and when the planning group members learned that their peers also had managed to benefit from the system, they began to see the usefulness of it, and “*the atmosphere [became] excited and relaxed*” as Ph.D. student noted in the observation notes. This is consistent with Eckhardt et al. (2009) discovered about social influence.

The final nail in the coffin of resistance was the introduction of the actual devices. At this stage, the resistance of the managers towards the system had already disappeared, and now the question about choosing the device was a mere technicality. Their attention focused on how they would ensure that the resistance of potential users would also be decreased with *aligning the incentives* (Ba et al., 2001). The managers compared the phones and considered how the potential users would perceive their usability in the expected environment. They considered phones with less features better (or less complex) than the ones IT experts recommended. These devices were seen as “*easier to use with less buttons*” for the technology illiterate potential users. Thus although they welcomed the knowledge of the IT experts, the managers considered their own expertise of the potential users more relevant, when choosing the phones.

4.3 Post-implementation activities: the resistance of end-users

When the possible uncertainties had been reduced by presenting actual user experiences that demonstrated the benefits of the system and the relevant hardware, the project advanced quickly. After the political decision makers in the towns had made the decision to adopt the system, the mobile system was ready for implementation in the winter of 2008-2009. The post-implementation activities and their effect on user resistance can be seen in Table 2.

In contrast to Venkatesh and Bala (2008), *organizational support* can be seen in the role of the IT departments before, during and after the implementation. In Town B the local distributor installed the software and according to the recommendations of the IT department they also took a service guarantee for the phones. The IT department made the necessary preparations. In Town A there were 29 workers who adopted the mobile system in phases. Although the IT department was present in the pre-implementation phases of the system, it was not available for the actual implementation. Therefore in Town A, the managers as well as the administrative clerk installed the software and prepared the phones, which were leased by the IT department from a local distributor. In the evaluation interviews, Town A managers expressed their dissatisfaction for this increased workload, which, however, seemed not to affect the end-user resistance.

Table 2. Post-implementation activities and the effect on user resistance.

Activity	Action	Effect on user resistance	Example quote
Organisational support 2	IT experts assisted in choosing the devices and service contract in Town B	Managers in Town A had to choose devices themselves, and did not get any help from local dealership in installing the application, which created resistance in Town A managers.	Manager from Town B: “The local dealership made an offer to install the software in the phones. And, if there is a problem, [the dealership] will fix it in two hours.” Manager from Town A: “We, with [clerk], installed the software ourselves.”
User participation	Volunteer pilot group for training was chosen	The most proficient users became advocates of the system.	»I have been trying to encourage the others too, to think about it positively and how much our work will be easier. ”
Training	System provider trained all the users in Town B and the pilot group and the managers, who then trained the rest of the users	Implementation problems were directed to the IT experts in Town B. In Town A, the users knew that the manager and pilot group peers could help them solving the simple problems.	Manager from Town B: “Once our IT person even went to help a [family day care] worker, when she had problems. Manager from Town A: “Oh, it’s been me who runs there [helping the workers].”
Peer support	Proficient users helped the others to learn the system.	Even the most resistant users were convinced that they could learn the system and it would be useful.	I called my colleagues also in the beginning 'Tell me how to do this, since I cannot make this work' and then she did help me.
Incentive alignment 2	»Smart« phones were purchased and given to the users at the training.	Users felt appreciated and important, since normally only »white collar« workers had work phones.	“Sure, I’ve shown this to my relatives; ‘see I have a work phone’. Sure I like it and I am a little bit proud [of it].”

The managers had informed their workers, who would be adopting this system, already in the planning phase about the future change. One worker actually quit her job, because she did not want to adopt the system. When the actual implementation time came, the managers called for voluntary *user participation* and were able to find small groups of interested users, such as the “*extrovert and social*” local trade union representative. These pilot users had an important role as the spokes persons for the system towards the other users. The pilot users were also “*a bit nervous before the first training*”, but after a 3-4 hour training the uncertainty had disappeared and they were able to promote the system to the others. In contrast to some previous studies (Hartwick & Barki, 1994; Venkatesh & Bala, 2008), the user participation was used after implementation, and was still beneficial, supporting for example Newell and Wagner (2007).

The biggest differences of the implementation process were in *training*, which was both task and technology-related (see Sharma & Yetton, 2007). Although the system was quite simple, including training in the implementation process was clear from the beginning for the (early childhood) education professionals and its organizing details had been discussed along the pre-implementation on many occasions.

In Town B, the training was given by the representative of the system provider company, and there were 6 users in the pilot group and 19 users in each of the last two training sessions, when the mobile phones were presented to them.

”Manager had to encourage me many times [in the training session] not to worry and to practice. It was not easy, there were many problems such as changing of PIN code, to finding the letters [on the keyboard] and so on. Everything was new.”

In the training, individual needs were attended to in order to decrease anxiety for complexity (“*I did not dare to press any key*”), increased workload, change in job content and risks of losing important information. In Town A however, the software company representative trained the managers and the pilot group, but since the training sessions were very expensive, the managers and the pilot group trained the other users by themselves in groups of seven or eight workers. The three or four hour training sessions in Town A followed the same pattern as the outsourced training in Town B. After the evaluation survey results (published in another paper) were analyzed, we noticed that there were no differences in user acceptance despite the variance in training. In contrast to previous studies (Sharma & Yetton, 2007; Sumner, 1999), the investment amount was thus not relevant for the results of the training.

According to the survey results (XXX, 2010), all workers in both towns deemed that their managers supported the use of the system. From the evaluation interviews, we discovered that during the peer to peer training the basis of *peer support* was developed “*I just call them to help me*” that also facilitated implementation success. The pilot group was involved in the training of Town A’s other workers, where some skilled peers may have earned the reputation of being an expert before the time of the training session, which led to them being consulted during problem situations (increasing self-efficacy (Eckhardt et al., 2009)). Apparently the peer trainers in Town A were able to provide positive experiences and thus the training outcome was good, as Galletta et al.(1995) have discovered.

“This is great. It boosts the image of family day care workers and I hope that other towns have the opportunity to do this.”

The *incentive alignment* could be considered as a critical success factor in this case, as can be seen from the exemplary quotation above. Some respondents commented that the work mobile phone raised them to a more prestigious position; they considered themselves more important now that the town had invested in a mobile phone for each worker. A work mobile phone was perceived as a status symbol, since normally only white collar workers with a managerial position had one, and family day care workers did not identify themselves as part of that group. Therefore the “loss of status” reason for user resistance was avoided in this case with the incentive. Our study thus supports the findings of Ba et al. (2001).

After a few months of using the mobile system, workers were very happy with the new system in both towns. The managers had developed different perceptions about the system by the end of project. One summed it up by saying, “*if we told the FDC workers now that this was only an experiment and we would take the phones back from them, I think they would say ‘that’s not going to happen!’*”. The implementation was a success, the organizations now have more accurate data and have saved time, which can be used for other tasks, the users have accepted the system, and even the managers are pleased.

5 Conclusion

This paper started with the research question: how do the different management strategies decrease user resistance and facilitate information systems implementation? A mobile system implementation in a technology laggard organization with resistant users was described here in detail. Although the system was simple, the resistance and anxieties were real due to the inexperienced user group. In this case, there were two different resistant groups, which had to be managed, namely: the managers and the end-users (workers). This study extends the prior user resistance literature by illustrating the importance of well-planned pre- and post-implementation activities in decreasing the resistance.

For the managers, the management support of directors was critical in justifying the increased workload. The managers had been appointed to several different projects and the directors had to really emphasize the importance of this implementation by being present in the planning group meetings, setting schedules and objectives. External change agents were also efficient in decreasing the management resistance. They especially decreased the anxieties about technical and other risks, change in job content and lack of fit.

For user resistance, the most important activities seemed to be training, peer support and incentive alignment. In training, the anxieties for complexity, increased workload, change in job content and risks of losing important information were handled. Peer support was useful in increasing self-efficacy of inexperienced users and handling problem situations. The significance of incentive was remarkable. It seems that the “work” mobile phone was the most important benefit of the whole project, the loss of status anxiety was changed into gaining a status symbol. This is naturally

understandable, since the other benefits were not as tangible to the workers as the device itself.

This study has some limitations. First of all, the system implemented was not a very complex one, but a fairly simple mobile system. Therefore the results of this study cannot be generalized to other kinds of systems and more research is required. In addition, the case organizations were quite small, and there were just a handful of users in both organizations, so the results have to be interpreted with this in mind. Another limitation is that the use of the system was not voluntary. This may have had a strong influence on the success of the implementations.

We also assert that management and organizational support should have a continuous role in the implementation process. This assertion should be validated through research made in other contexts, as should the role of the support of external change agents. It would also be interesting to study cases which use a smaller amount of activities or a passive management strategy in order to see which are the most important because the results of this study revealed that there were differences only in some activities and not all of them.

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