The Slow Adoption Rate of Software Robotics in Accounting and Payroll Services and the Role of Resistance to Change in Innovation-Decision Process

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Abstract: Robotic process automation (RPA) has by now for years been viewed as a disruptive innovation that will have a significant impact on accounting, HR and payroll services, and yet the rate of adopting the innovation has not reached a level anticipated in past predictions. As several elements have a negative impact on the organization's rate of adopting RPA, passive resistance to change has a significant impact in the form of constant dithering. Resistance to change can emerge at any stage of the Innovation-Decision process and fluctuate throughout the continued adoption, causing wasted investments, capabilities and resources.

Keywords: disruptive innovation, resistance to change, technology adoption, Diffusion of Innovation, robotic process automation

1 Introduction

Earlier studies of adopting and accepting technological innovations have been heavily centered on consumers', citizens', or organizations' initial decisions on adoption. Continued adoption is a much less known and theorized phenomenon. Later stages of the lifecycle of an information system are not clearly, if at all, portrayed in the established theories such as Diffusion of Innovation (DOI). A technological innovation which is not capitalized even near its full potential is a wasted investment, and it may impair the process of making other strategic decisions. Robotic process automation (RPA) was identified possibly to be one of these innovations when several job announcements for accountants were being spotted. This was related to one of such advertisers, and it was found out that they suffered from a constant lack of accountants and that the need for them had not decreased.

Customers of accounting and payroll services on the public sector expect inexpensive services with high quality while their services need continually to be increasing due to such demands as more advanced economic analyses and forecasts, or because of new regulatory and legislative requirements. Robotic process automation has been on the market for a while as a solution to the urge to increase organizations' economic efficiency and productivity by reducing manual work and transferring routine tasks from accountants and payroll experts to robots and thus freeing time for tasks which

require competent understanding of financial services, such as customer interaction, substance-related problem solving and economic analysis. It has been viewed as a disruptive innovation that will have a strong effect on jobs and working methods. While many organizations may have initially adopted the RPA, the rate of adoption within the organization may be lower than initially anticipated, and thus the desired economic efficiency, improved quality of services or the desired range of offered services is not achieved.

This paper presents the research insights of an interpretive case study of adopting RPA among accounting and payroll services in the public sector when the role of resistance to change is considered as a part of the Innovation-Decision process of Diffusion of Innovation theory. Reviewing available earlier studies shows only a small number of articles centering on continued adoption, discontinuance, and especially on what role resistance to change is playing in continued adoption when it stops or progresses at a slow rate. This paper is primarily interested not in understanding or evaluating the technological potential of RPA itself but in understanding the critical elements of the slow rate of continued adoption of an innovation and especially examining the role of resistance to change on organizational level. An auxiliary interest lies in examining possible accelerating factors of the adoption process within the organization. This is done with the purpose of identifying possible factors that may impact the continued adoption of disruptive innovations in organizations which rely on both ICT and professional labour to offer their crucial services.

2 Adopting an innovation

2.1 The theoretical background to adopting technological innovations

Several theories and frameworks aim to explain how individuals and organizations adopt and accept innovations, including TRA, TAM, TPB and Diffusion of Innovation (DOI) theory. Theory of Reasoned Action (TRA) can be applied to explain behaviour in adopting technology. It emphasizes intention and personal attitudes and also the subjective norms which prescribe the intention [1][2]. Technology Acceptance Model (TAM) is a further developed model from TRA and emphasizes perceived usefulness and perceived ease of use as a positive influence on the adoption process. Though widely used, some scholars argue that TAM has significant theoretical limitations because it neglects factors that dominate social, institutional, and individual behaviour [1]. Theory of Planned Behaviour (TPB) is an adaptation of TRA as well. Perceived behavioural control is a key factor of TPB, which has been widely used and further developed into such models as decomposed TPB, which furnishes even more attributes or factors for behavioural models, such as relative advantage, compatibility, the influence of significant others, and risk [1].

Diffusion of innovations [3] and its different models and frameworks is widely used in research relating to diffusion and adopting technological innovations.

The adoption of new technology is influenced by three key elements: the characteristics of the innovation, the aspects of the organization making the decision to adopt, and the prevailing social system [4][3]. Slow adoption of technology results from

several factors, such as financial costs, resistance to change and slow diffusion of the innovation [5]. Patterns of adoption vary between countries, cultures, and subcultures [6].

Innovations that are based solely on information, the "idea-only" innovations, are, according to studies, adopted at a slower rate due to a lower degree of observability compared to hardware and software-based innovations [3]. The study of RPA adoption encompasses the diffusion of software-based RPA technology as well as the idea of a change in the roles and operating modes of professionals. A fundamental concept of DOI is the Innovation-Decision process where the adopting unit processes information with the purpose of reducing uncertainty about the advantages and disadvantages of the innovation, forming an attitude towards it and deciding either to adopt or to reject it. The Innovation-Decision model has five main stages: *1. Knowledge, 2. Persuasion, 3. Decision, 4. Implementation and 5. Confirmation*. [3]

Perceived characteristics of the innovation play an essential role in the adoption process. Organizations may be divided into different *adoption categories* based on their innovativeness [3][11], and, based on their adoption category, various characteristics of an innovation may be important to them [13]. DOI includes five attributes for innovation*: relative advantage, compatibility, complexity, trialability and observability* [3]. *Voluntariness* and *external pressure* are included in some research [7]. Relative advantage has often been found to be the key attribute in explaining the factors influencing the adoption [8]. *Perceived risks* have been found to influence the decision of adopting technologies as well [9], while the original DOI hardly touches the topic. Scholars have introduced several other attributes to cover comprehensive research of adopting and accepting technologies, such as *trust* [10], *image* and *result demonstrability* [11], and *price, problem solver*, *standards* and *technological edge* [12].

2.2 Resistance to change and insecurity

Resistance to change is an emotional reaction to either real or imagined threats to established practices [14]. Although resistance is a natural tendency in people, not all react equally or at the same degree [15]. Some scholars presume that the more innovations shape our everyday life and technology and science become a more central part of it, the more controversial is their impact on society [6].

The resistance to change may take many forms from direct resistance, such as quarrelsome behaviour and even sabotage, to indifference and passive behaviour, for instance dawdling and withholding information [16][15] or refusing to accept new responsibilities or tasks [17]. In multi-level categorizations, even more passive actions are called *apathy* [17]. Resistance to new technologies in organizations varies depending on the market and society in which they operate [6]. Different types of resistant behaviour are not entirely similar in customer and organization studies. Thus earlier case studies and their research findings inform the possible outcomes of the new research at hand when adoption in organizations is being studied. Group dynamics and sub-group characteristics are important factors to consider. Individuals may for exam-

ple abandon a technology because of solidarity towards their colleagues even if they are initially willing to adopt it [17].

Resistance may emerge at different stages of the process of change – and not only in the beginning. For example, in a debate on change relating to software development it was observed that just as the dialogue was beginning to stabilise a new actor joined the discussion in order to undermine the consensus [18]. *Change agent*s and *opinion leaders*, such as *early adopters* and widely respected persons within the organization as well as at the management level, have been key actors in generating positive response to change and mitigating the resistance [16][19]. Positive experiences such as work-related improvements may nudge groups and sub-groups towards adoption [20] and work as *trigger*s to change [17][20].

Lower levels of resistance have been observed in processes of change when a given change is compatible with existing practices, the methods are visible and transparent [21], and people can participate in the process [2]. On group level, the loss of control has led to non-adoption and resistance [20]. Without a motivation for change, change itself can be seen as a threat. Its risks are estimated higher than its benefits, and not much trust is placed on the successfulness of the change [22][15]. For example, it was discovered quite some time ago that e-governance projects tend to fail more often when no preassessment is conducted related to readiness for change, in comparison with projects which examine both readiness for change and the cultural factors of the target organization [23].

On an individual level, resistance to change may be caused by unfulfilled expectations, lack of participation and interest, and the lack of IT skills. On group level, dispersion of interest, power structure and complexity are significant reasons. [2] Resistance to change may vary within an organization both vertically and horizontally, and it is beneficial not just to consider the organization as a whole but to examine its different subgroups. Not only management and specialists may have opposing opinions, but also other teams involved in the change. For example, differing views on the characteristics of an innovation, such as *relative advantage*, *compatibility* and *price-quality ratio*, may cause disagreements between users and developers [24].

Different demographic groups within the organization may also react differently, and it is tempting to assume that younger workers are more tolerant to change, but age cannot be seen as the only determining factor. Individual characteristics such as IT skills mentioned above have an effect and, among others, it has been indicated that technologically savvy digital natives and flexible thinkers are less inclined to resist change [25].

The results of a scoping review drawing on several research databases seem to suggest a shortage of published research on the process of adopting RPA technology and resistance to change, especially in organizations that provide financial or payroll services to external customers. However, some studies related to attitudes towards disruptive technologies and job insecurity do exist, but resistance to change has not been discussed in them. In Portugal, an RPA study on shared service centres indicated that RPA became institutionalized less on the basis of “normatively rational decision making” but rather “the taken-for-granted norm of increased efficiency”, and the speed of adoption was a significant factor [26]. A study among service sector em-

ployees in New Zealand indicated that they did not feel particularly worried about their jobs and felt "there is little change forthcoming while their employers appear to be considering the potential cost benefits" of *Smart Technology, Artificial Intelligence, Robotics, and Algorithms* [27].

Official statistics of Finland show that in 2020 only 7% of Finnish companies in the administrative and support services sector used service robots [28]. While official work-life studies in Finland assert that 23% of employers in workplaces that had laid off workforce within past few years felt that digitalization and robotics were contributory factors in their workplaces [29], the studies do not indicate whether robotics were considered as a threat. Nevertheless, studies show that RPA and AI are on the increase in accounting and auditing and are believed to have a significant impact [30].

3 The case study of a publicly-controlled company

Public bodies in Finland have established private companies under their control to provide financial, HR and payroll services for theirs owner-customers – such as municipalities, social and health care districts, and public utilities. The case study was carried out in one of such Finnish service centres owned by several municipalities and other public agencies. The organization under the inspection provides ICT services to its owners along with the financial, HR and payroll services, and the ICT department is responsible for both internal and external ICT services. The ICT department is also responsible for the implementation of robotics for its internal customers, for example the payroll service, as well as providing RPA infrastructure services to its customer organizations. The actual coding of the robots has been outsourced to a contractor. The organization has established a sort of loose, virtual team including payroll and financial services and ICT specialists to survey and evaluate new automatization ideas and to coordinate the development. The company went through a merger in 2019 when three such publicly-controlled companies merged into one and have since been harmonizing its services, processes, and tools.

A case study was conducted to explore this process in its context. It focussed on one company, and semi-structured interviewed were held between February and April 2021 for the purpose of gathering data. The case organization provided process documentation as supporting evidence. The method was chosen because it is suitable for the early stages of building a theory and can be used to understand the phenomenon – a new topic – in context [31]. A case study is a suitable research strategy for "capturing the knowledge of practitioners and developing theories from it" [32].

The interviews consist of discussions with eleven key persons. The interviewees are listed in **Table 1,** and the interviews lasted between 45 and 90 minutes. Before the interviews proper some pre-discussions were carried out with interviewees A, B and K so that the interviewer could familiarise themselves with the background information, identify the target services of the case study (accounting and payroll services) and determine who are the correct key persons to be interviewed. People were chosen from all levels of organization to ensure different points of view.

The pre-formulated questions were put together based on the pre-research so as to provide a handbook for the interviews, and some new questions emerged during the interviews. The questions were carried out in an order which best matched the natural flow of the dialogue, and they also varied a little depending on the role of the interviewee. The sample size was chosen to include people from all levels of the organization and only people who had been active in decision-making or the implementation stage or working among robot colleagues. The possibility of adding other interviewees was left open in case the previously selected ones suggested any, but the number of interviewees did not increase while collecting data as common themes began to emerge from the interviews and the interviewees did not identify anyone else. The saturation point was considered as reached when no more new themes came out of the interviews.

Interviews	
Interviewee A	ICT architect, technology leader in RPA (among other technologies)
Interviewee B	Project manager in HR and payroll services, responsible for coordinating cross-organizational, virtual RPA and Automation team
Interviewee C	HR services specialist, works with robots and contributes to the development project as substance expert
Interviewee D	ICT specialist, works in automation technology
Interviewee E	Service manager in payroll services, leads the team (internal client) adopting robots as co-workers
Interviewee F	Service director in HR and payroll services, one of the decision makers on questions relating to making use of robots
Interviewee G	HR services senior specialist (responsible), works with robots and contributes to the development project as substance expert
Interviewee H	Accountant, works with robots
Interviewee I	Accountant, works with robots
Interviewee J	Service manager in accounting and financial planning, manages accountants, internal client
Interviewee K	Service manager in ICT development, responsible for the RPA service

Table 1. Interviewees from the case organization

The interviews were recorded and written down as interview notes, with key parts of the discussion transcribed word for word. The notes and transcriptions were first divided into themes directly after the interviews, the first results organized into a table of themes and descriptions. These results were then re-examined by re-analysing the notes and listening to the interviews, the themes iterated and adjusted, and the final results construed from this iteration. The earlier theory which was used as theoretical framework when preparing this study (and as introduced in chapter 2 of this paper) was also revisited during the analysis in order to find out whether it was still in line with earlier studies. Though we did not build heavily on any a priori hypotheses, we used the theoretical framework, and thus the results add to the earlier theories as the

analysis of the results expands the Innovation-Decision process and some of the key concepts of DOI. We conclude with a conceptual framework [33].

4 Findings

The interviewees, in general, were not satisfied with the level of robotics used in service processes. Adopting robotics had taken its time, and as Interviewee B recalled, they had "a bumpy start". The first robots were taken into use approximately four years ago. Some of the earlier robots had already been retired, as one of the interviewees (A) explained. By the time the interviews took place, the organization had only two robots in use to automate financial and HR & payroll services, and around 40 ideas were under general evaluation, ten of which had advanced to a more comprehensive technological evaluation. The organization's management was not in general satisfied with the current state of the undergoing change.

The robots currently used by accounting and payroll services were developed to solve problems in VAT logging and data matching for the national income registry introduced in Finland on 1 January 2019. Neither of the robots' tasks should be considered minor ones – it used to require several days per month from the personnel responsible for these tasks.

The case organization wishes to use robotics to transfer time-consuming work, such as data matching and manual error search (based on knowledge and visual inspection) to robots and to free its' experts working time to such tasks as development, analysis and problem-solving while relieving the overall workload. Accountants and their directors had pointed out during the pre-discussions that they wished that accountants, for example, could use their time and deep customer knowledge to help those customers who themselves had few resources for analysing financial figures. Other automation technologies were in use, for example, to automate batch jobs, and software developers were sometimes keen to develop automation with IS supplier directly on the IS itself even if it meant delays. The customers were moderately interested in robotics, but in some circles enthusiasm had already waned, possibly because the service centre side had not supplied any, as Interviewee K pointed out. The organization was hesitant to promote robotics to its customers.

Based on the interviews, the organization was, in general, in consensus of the reasons which had led to the slow rate of adopting RPA. The most common reasons highlighted by interviewees were:

- lack of resources (experts) and knowhow at both ICT and financial & payroll services
- lag in establishing structures needed in RPA development
- lack of viable RPA development targets, i.e. ideas, possibly due to resistance to change, lack of trust in technology or general passivity
- prioritizing other projects, e.g. customer projects or general harmonization of service processes after the merger
- technological problems either in RPA projects or in the enterprise architecture (other IS, infrastructure etc.)

Most interviewees discussed resistance to change. The topic was not introduced to them through a specific question, but rather they were asked what positive and negative memories they had relative to the adoption. Many of the interviewees also mentioned that they themselves had not been active enough and/or had not taken time to be interested in and learn about the technology. As opposed to some earlier studies [e.g. 17, 34], we did not note any resistance that would have been heavily related to normative status or peer pressure, at least so that this could have explained the slow rate of adoption.

Other essential sub-elements were found beside the factors given above, but in this paper we concentrate on those which are related to subtle forms of resistance to change, apathy, and the overall concept of resistance within the adoption process. As described earlier, resistance to change was explicitly mentioned in the majority of the interviews, but what was interesting is that the interviewees did not draw particularly direct connections between resistance and meagre use of RPA. They, however, brought up the dearth of viable RPA ideas from the teams and general lack of interest in actively participating in the projects. When analysed, the interview memos and records led to the conclusion that general apathy and dithering were a major factor in slowing the speed of adoption and causing vicious circles of other difficulties such as the factors listed above. *Dithering* is considered in this paper as a specific, hidden type of resistance to change.

4.1 Resistance to change and its impact

Some of the managerial level interviewees mentioned that they had heard, either directly or indirectly, that the personnel saw robots as a threat to their jobs and had even trouble finding a motive to participate if it would lead to loss of employment. Managers felt that this resistance could at some points be sensed in the atmosphere even when no one told them anything directly. As expected, professional level employees were more likely to hear about their peers' fears and attitudes.

The management had observed, again either directly or indirectly, resistance to adopting RPA but emphasized that it was more prominent at the earlier stages of the adoption process. They talked about resistance on service team level, not on management level.

"[On a team level] Probably some sort of fear for one's own job, that is there enough work for us? But maybe people have now realized that we have just a terrible lot of work, even if some of it was automatized. But it was this type of thing at least in the beginning, that now the robots are coming and taking our jobs." Interviewee G

"When the RPA group started, people were maybe feeling expectant and curious, but some remained indifferent – it does not consider them, they are not interested."

"It was a challenge that it took time – for me as well – to see the possibilities in robotics. Also, here still prevails some fear that robotics will eat up our jobs." – Interviewee J

"Directors, managers, they understood the ideology of what we were doing. But let's say on staff level it is understandable that if you come and say that could you teach a robot in your place, it may have adverse effects on motivation. And I don't know how much it has affected the effective implementation of automation, but I would argue that if not directly, then at least by proxy. The level of commitment may be lower. This point of view has not in my opinion been recognized enough by the management in many organizations, namely that people are actually afraid of losing their jobs." – Interviewee K

While interviewees typically believed resistance to be more common in the more senior age group of employees, it was considered to depend on other characteristics of the individual as well, such as general interest towards new ideas and technologies and willingness to give up routines. Yet they felt that resistance to change, while prominent, was not one of the most substantial reasons for the slow rate of adoption. None of the interviewees were openly against the RPA technology.

People may also have been unwilling to give tasks to robots at earlier stages of adopting robotics during the proofs of concept. The types of resistance and attitudes towards robots mentioned earlier in this paper indicate that resistance experienced within teams may lead to a lack of viable ideas for targets of RPA development. The organization thought it essential that teams are active in generating ideas as managers often do not have comprehensive knowledge about everyday tasks carried out by the services, and the ICT personnel and robot developers were even more unfamiliar with the topic. A small group of enthusiasts could not gather and further refine ideas, because they were often involved in other development projects and had critical roles in service delivery.

Resistance was implicitly found to be more prominent among such personnel who did not actively participate in the process of change. Unfortunately no one discussed how the resistance from peers and subordinates was affecting the motivation of key personnel to promote the change. They however did bring out how little time they had to allocate for development even when they were motivated to participate and wished that more experts would participate in the change. Managers felt guilty for not being able to prioritize the RPA development over their other tasks.

Problems with the robots and shortcomings of the technology itself were often mentioned as reasons why not only the project was time-consuming but also why some ideas were rejected during evaluation. As there are other companies in the same sector that have been able to proceed more swiftly, it should be considered whether negative observations were overemphasized, whether there prevailed a general lack of interest in prioritizing problem-solving in RPA cases over other tasks, or whether the chosen model of production (outsourcing) was suitable for the organization or not. Overall, the consensus was that RPA was not prioritized over different projects and services. Decision-making had taken its time on all levels, and the focus had shifted to other areas.

Though the personnel was generally welcoming the robots they were at the same time critical towards RPA as technology, and especially the ICT team could not wax particularly enthusiastic about it as they considered it as just one tool among others (and possibly preferring others) – maybe even outdated before it was even properly

implemented. Interviews hinted at compatibility issues with information systems and technological traditions.

"You might think that this [interview] sounds cynical, but I have been seeing this for so long now and I consider RPA as a basic tool. And as a tool it is not a top priority in certain cases of automatization. Nowadays we can take care of it in many other ways." – Interviewee A

"Maybe we senior specialists are somewhat critical about automatizing all the controls and so our efforts are still needed… We need slowly to teach the robot and teach it about the errors. We cannot trust it completely for a long time yet." – Interviewee G

4.2 Factors behind resistance

The interviewees who were the most enthusiastic about robotization were either those whose work the first robots had taken or their managers. It is essential to realize in this context that robots were of help to the specialists. They welcomed robots to help them with the time-consuming work of cross-checking, which required an understanding of the task but could be taught to the robot by using a set of rules. For the most part they were also satisfied with the quality of the robots' performance. HR and payroll experts had ever since the introduction of the national income registry faced constant, time-consuming problems matching the data from payroll systems with the data sent to the registry. When the idea of solving the problem with robots came up, it was being lobbied and eventually resulted in one the desired robots that were developed into production.

Beside general knowledge of what kind of robots can be used, HR and accounting experts mooted the lack of knowledge about the practical exploitation of robots as a critical factor that both prevented ideas and caused increased criticism towards robots and their potential. For instance, one of the experts said that a substantial idea had been suggested, but they had been critical whether the robot was capable of such tasks as they did not fully understand the capabilities and limitations of RPA. Another expert pointed out that only after the VAT project they had begun to understand what can be done with robotics and would still need more knowledge to fully participate. One manager told of having being quite indifferent until a certain technological presentation had opened their eyes and created what they called a "wow effect".

"We have constantly more work to do at a certain pace, and job descriptions change all the time… I don't know whether this is some sort of treacherous measure, to give us more work so we will realize that hey, we should use robots. I at least feel that my work will go smoother if I can use automation and robots in certain tasks." – Interviewee G

The ICT department had the necessary knowledge of technical issues related to RPA, and compatibility with the target systems was often the main cause for resisting further development of robots or automation tasks in general. Technical personnel also took into consideration information security and data privacy in the development and thus saw more risks in automated assignments. The ICT department was lacking

professional resources to develop the actual robots themselves and relied heavily on outsourcing.

"We have proceeded with implementation taking cautious steps… None of us has been released from other tasks, and especially the IT department is always lacking resources."- Interviewee C

"People were very positive. In the beginning, when an [Automation and RPA] group was established, we got ideas. Now there is a quiet phase as nothing ends up in production."

Interviewees said that there had been internal campaigns to promote robots and automation in general, and in those times ideas came in bursts. But when ideas did not soon lead to production, people lost interest. Interviewees expected that attitudes would change towards a more positive direction when more success stories were made public, such as the VAT and income tax registry robots. The robots were somewhat anthropomorphized during the interviews. For example, Interviewee B wished that the teams would always give robots a human name, such as Pekka or Elina (typical Finnish names). Interviewee A used the term "old age pension" about a robot that was not needed any more.

The factors which had a negative impact and caused slowness or resistance can be summarized as:

1. Problems with the **compatibility** of RPA with enterprise architecture and technological traditions.
2. **Lag in processes** when organizing RPA development and putting new ideas into production.
3. **Scarcity of professional resources and knowledge** creating hesitance to move forward with development and to suggest new ideas.
4. **Fear** of robots taking jobs and distrust of their capabilities.

Based on the interviews, resistance to change is reduced when:

5. **Relative advantage** is seen high either on individual (e.g. personal workload and interests) or organizational (e.g. ROI) level;
6. The organization can advertise internal **success stories** which bolster trust in the innovation and motivate people to participate;
7. **Indirect external obligations** which substantially weaken the status quo shift attitudes towards the original change into more positive directions (e.g. new, substantial workloads generated from changes in legislation).

4.3 Resistance to change fluctuates and has an impact on every stage of the Innovation-Decision process

The conclusion drawn from the earlier findings (see **Fig. 1**) is that resistance to change can be prominent even when the original Innovation-Decision process has led to the adoption of an innovation: it takes place on every level of the organization by reducing the speed of adoption. The findings of this study are placed in **Fig.1** into the

context of Rogers' Innovation-Decision Process [3] and its basic stages. Resistance takes many forms, often passive ones, and it occurs in pulses or fluctuates throughout the initial adoption process as well as its continuation stage. Resistance may re-emerge even after a period of time when a more positive spirit has prevailed, should the process of change take more time than anticipated, if the overall solution, including the innovation as well as the enterprise architecture, is not as compatible as expected and if professional resources and knowledge, especially knowhow related to the innovation, are scarce and people experience fear or general distrust.

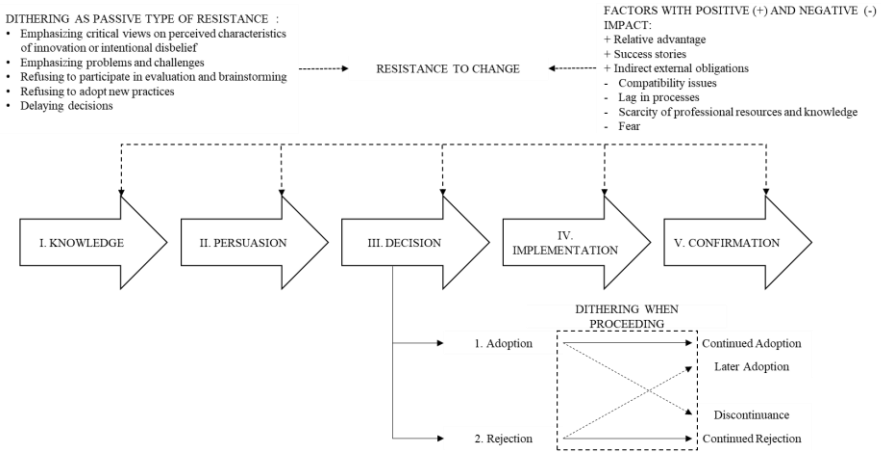

Fig. 1. Innovation-Decision Process (Rogers 2003) and resistance to change. Factors with positive impact reduce the resistance.

It should be borne in mind that individuals within the organization may go through the process of adapting innovations at a pace that differs from organization as whole. Also such a technology as RPA consists of several stages of its implementation, i.e. there a several robots, and thus the stages in **Fig. 1** are repeated over and over during the continued adoption. According to the findings of this case study, resistance to change can manifest itself at different stages of the Innovation-Decision process as follows: at *knowledge* stage resistance manifests itself as fear or distrust, at *persuasion* stage as unwillingness to take interest in or learn about the technology, at *decision* stage as active resistance or by delaying the decision, at *implementation* stage as dithering and overemphasizing problems, and at *confirmation* stage as emphasis on critical views or as cynicism and refusal to adopt new practices.

5 Conclusion and suggestions for further research

The findings of this study include themes of a priori knowledge but also new observations from which can be concluded a concept that does not completely follow any established theoretical frameworks of IS research. We found out that while the case organizations see many reasons that explain a slow adoption rate RPA after the

initial decision to adopt and the first actual use of software robots, these reasons culminate in organization-wide dithering, which can be viewed as a passive type of resistance to change. While more active resistance may emerge within the organization, this dithering is the key problem which not only slows the adoption process down considerably but also creates vicious circles of other problems. This dithering and dwelling on problems, which yet were not deemed insurmountable or significant, caused bottlenecks with may have impacted other projects as well.

We found out that an organization needs a steady flow of **success stories** to build up trust in technology and reduce resistance. Success stories generate much-needed new ideas for robots from the teams. In order to expand properly, RPA requires cross-organizational adoption and also learning from the part of IT and those service teams which are its target. If the development of a single RPA item takes too much time, the adoption process regresses and confidence in the innovation declines. The organization lapses back to apathy which may eventually lead to discontinuity.

The most important factor to accelerate the process of adopting a new robot appears to be an indirect obligation to make other changes. When faced with an external impulse, a new problem, it seems that motivation is improved and attitudes towards the original change become more positive. RPA is viewed more as a tool for problem-solving than as means for the targeted services to achieve better cost-efficiency or productivity.

We also found out that resistance fluctuates both during the different stages of innovation decision process and the continued adoption phase. Success stories and activity reduce resistance, but if the pace of implementing projects is not brisk the organization may relapse into apathy. Unfortunately, the strongest motivator to pick up adoption speed was an indirect force. Thus circumstances were already tough resource-wise, and the new demands made it necessary to seek out solutions from existing technologies. In this situation it was still difficult to proceed with the projects due to insufficient working time and personnel to allocate for the projects.

Some of the findings in this study are in line with previous DOI-oriented research or adoption theories. We found that the innovation characteristics of **compatibility and relative advantage** play as important a role in attitudes towards technology in the later decisions to continue as in the initial decisions to adopt. The Innovation-Decision process with its five stages was seen as a suitable basic framework on which to build the key findings of the study. Relative advantage works on both organizational level and individual level. On individual level there is an interest in using robots as a tool towards smaller personal workloads but also sometimes as an opportunity to take a new professional direction in work. Accountants and payroll experts found robots to be a welcome improvement when the baseline of workload was optimized.

We come to the conclusion that passivity in taking actions may create vicious circles which have an effect on the further continuance of the adoption process and possibly even on the adoption of new disruptive innovations in the future. Hesitation on all levels has several costs. As Interviewee A put it into words, there was a lot of “waste” and the robots were “underemployed”. Thus money and time had already been spent on investing in the technology, business relations with the subcontractor, establishing structures and training employees, but robots were underemployed while human employees were overworked. The waste of potential and investments was

considerable. While interviewees from the ICT emphasized that other, possibly more desirable options were available, it was commonly believed that the overall automatization of HR and financial services was not on the desired level, and, as a result, neither were competing technologies used to satisfy the requirements.

Organizations should deepen their understanding of the elements which characterize the organization as a whole and its different departments as well as the management level and delay their processes of change. They should proactively seek solutions that may be exploited during future changes and that prevent wasting investments and other resources. This is developed from the observation that not all forms of resistance to change manifest themselves actively, and yet they have a negative effect on the entire process of change. Management should not be forgotten either. As a conclusion for organizations and IT managers we suggest that:

- Senior management should put effort into managing change throughout the whole lifecycle of the technology on which they have invested and which is deemed strategically important.
- Costs of a single implementation project should be put into a wider context, and it should be taken into consideration whether hesitation in making extra investments and going forward feeds general incapability of progressing and meeting other strategic goals. Projects that do not go forward are still a waste of resources, such as working time and expertise of personnel lost in dithering and money in terms of the basic investment.
- Organizations should investigate whether they have tendencies towards passive resistance, such as constant dithering, and address this topic actively to avoid waste. Constant dithering may easily lead into a vicious circle of problems and shortages that is difficult to undo.
- Process of change can be kept active and the teams' attitudes nudged towards positivity and trust when even small success stories are steadily introduced. When trust and enthusiasm is gained, it needs to be fed.

The conclusions of this study were based on one case study, and they are partly supported by other scholars and their earlier studies. While discussing and analysing the reasons for the slow speed of adoption, the critical finding discussed in this paper is that when adopting disruptive technology, resistance to change should be taken into consideration even when there is no active opposition, and an organization should take active measures to reduce it and build trust during every stage of Innovation-Decision process and not just at the initial stages of change. This finding is in line with some earlier studies [20], but much research is to be done to understand better the patterns on organizational and sub-group level as well as group dynamics in organizations that are not highly normative.

This research has its limits as it focusses on one interview-based case study of one organization and one technology. Further research on the role of dithering, a type of passive resistance, in the continued Innovation-Adoption process of organizations is needed to build up and validate the theory. Thus, these findings should be tested against a larger sample or a wider array of technologies with slow rates of adoption within organization. We also realize that the company in our case study had undergone a merger two years earlier and recognize that this may have an impact on the

findings. More comprehensive research into the innovation-adoption of RPA in financial, HR and payroll services may be beneficial when assessing adoption processes of artificial intelligence as well as when determining the next steps in either expanding or discontinuing the use of RPA.

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