UNIVERSITY OF GOTHENBURG

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EXPLORING ACCEPTANCE AND ADOPTION OF PRICING ROBOTS THROUGH THE AUTOMATION ACCEPTANCE MODEL

A case study within an e-commerce company

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Abstract

Recent technological advancements have enabled the development of more automated and adaptable technological environments. User acceptance and adoption of technology is a critical issue in the rapidly evolving technological landscape. Implementation of automation technology takes both financial and human resources. It is important for organizations to get a return on their investment. We have conducted a case study at an e-commerce company implementing a new dynamic pricing robot, automizing the pricing process. In this research, we provide further knowledge on how to enable acceptance and adoption when implementing automation technology in the workplace. The study takes place before, during, and after the implementation over a period of nine months. The Automation Acceptance Model (AAM) has been used as a guiding framework for research. This research indicates that the current AAM framework may not fully explain all factors influencing user acceptance and adoption. Our findings suggest psychological ownership (PO) as an additional construct in understanding how individuals accept and adopt technology. Psychological ownership is directly influenced by external factors and is directly influencing the behavioral intention to use automation technology. Through this study, we contribute to enhancing knowledge about factors that influence technology acceptance and adoption among end users as well as providing insights regarding the potential of the AAM framework towards the adoption of automation technology.

Keywords

Automation acceptance model (AAM), Automation technology, Dynamic pricing robot, Technology acceptance model (TAM), Technology acceptance and adoption, Technology trust, Psychological Ownership (PO)

Foreword

First, we would like to thank our supervisor Dina Koutsikouri for lots of inspiring discussions and valuable feedback. Without that, we would not have had the courage or wisdom to change the course of this research and get the results we did.

We would also like to express our gratitude towards the company. Without the trust and access, we were given to crucial participants and data, we would not have been able to achieve the same depth in this study.

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List of Abbreviations

AAM	Automation Acceptance Model
CE	Cognitive Engineering
ERP	Enterprise Resource Planning system
GTIN	Global Trade Item Number
GUI	Graphical User Interface
PO	Psychological Ownership
Robot 1	Old dynamic pricing robot
Robot 2	New dynamic pricing robot
RPA	Robot Process Automation
SaaS	Software as a Service
TAM	Technology Acceptance Model
TAM2	Technology Acceptance Model 2 (Extension of TAM)
TRA	Theory of Reasoned Action

1 Introduction

Companies are increasingly adopting and integrating new technologies into their organizations, and it puts pressure to transform processes and ways of working (Kane, 2019). Companies across different sectors are forced to be more agile to improve their ability to innovate and be productive to stay ahead of the competition (Govers & Amelsvoort, 2019; Koutsikouri et al., 2020). Taking advantage of new technologies is many times crucial for survival (Shahi & Sinha, 2021). Implementing new technologies can be deceptively simple, but getting users to adapt is a more complicated undertaking since it requires shifting the habits and mindsets of employees (Kane, 2019). Changes in technologies as well as organizational structures can help companies create an improved workplace experience for employees. One type of technology that has been implemented across various contexts is automation technology (Asatiani et al., 2019). Some fields where automation technology is present are banking, educational institutions, health care, and e-commerce (Moorthy et al., 2023). Automation technology is used for the automation of processes. By automating processes and thereby replacing human manual work, workflows can become more consistent, easier, faster, and more affordable (Puaschunder, 2020). One of the most adopted forms of automation technology to enhance and transform business processes in organizations is Robotic Process Automation (RPA) (Asatiani et al., 2019). RPA facilitates business processes by becoming more automatic, often through a Graphical User Interface (GUI). Repetitive tasks previously carried out by humans become automated, without replacing the original business application. A commonly cited benefit is that it allows more time to perform tasks with higher value involving human decision-making and innovation (Hofmann et al., 2020; Richter et al., 2018; Willcocks et al., 2017; Puaschunder, 2020). In this sense, automation can be described to reshape the structure of tasks. It replaces old tasks but also introduces new tasks and responsibilities, such as coordinating and monitoring. While automation technology can help produce business value, it can also influence the experienced usefulness of human work (Ranerup & Henriksen, 2022; Bankins & Formosa, 2023).

Research suggests that organizations that incorporate automation technology need to be mindful of the extent that automation will enhance or optimize existing work processes (Fung, 2013; Jovanović et al., 2018). There is a tendency for organizations to neglect careful planning which is necessary before implementation. Not enough planning can lead to severe new problems and decreased productivity, which may hinder uptake and trust in current and future technology (Siderska, 2020).

More research is needed to deeper understand the factors that contribute to user acceptance[1] of automation technology to drive adoption[2] in organizations. The process typically begins with acceptance, as users need to embrace and acknowledge the technology before making the decision to adopt it (Davis, 1989; Venkatesh et al., 2003). Once the technology is adopted, users can actively utilize it to access its intended benefits and advantages (Davis, 1989; Venkatesh et al., 2003). Existing studies have provided useful insights regarding the implementation of automation (e.g., Asatiani et al., 2019; Ranerup & Henriksen, 2022), and usage of automation (e.g., Pink et al., 2022). Current empirical research lacks guidance for practitioners implementing automation regarding how to improve user acceptance and adoption. An investigation of previous research in Scopus (2023-04-19) database reveals that research about RPA has exploded during the last years and continues to increase, but out of 3296 documents with "Robot", "Process" and "Automation" in the abstract, only 19 were conducted in the field of e-commerce. Thus, more empirical research is needed to broaden and deepen our understanding of RPA in the context of e-commerce.

1.1 Purpose and research question

The purpose of this thesis is to explore the factors that influence user acceptance and adoption of automation technology. The study was conducted at an e-commerce company located in Gothenburg during the replacement process of a dynamic pricing robot. The dynamic pricing robot in this context monitors competitors' prices and automatically updates the company's prices based on a set of strategies. The robot is a SaaS (Software as a Service) solution, and similar solutions with similar technology are available from many different vendors. The automation acceptance model (AAM) has been the guiding framework for our research. The following research question was chosen and has guided our study:

RQ. What factors affect acceptance and adoption of automation technology?

By answering this question, we endeavor to provide relevant insights for companies about how to understand technology acceptance and adoption. We aim to enhance knowledge regarding the root causes of challenges when implementing automation technology and suggest ways to mitigate them. The disposition of this thesis is structured as follows; Chapter 2 introduces related work and previous research. Chapter 3 establishes the conceptual framework used for analyzing the findings. Chapter 4

[1] Acceptance is an attitude towards technology.
[2] Adoption is a process that begins with the user's awareness of the technology.

presents and motivates the chosen research approach and data collection methods, and additionally the analytical process. Chapter 5-7 introduces the findings from our study and a discussion of presented results. The final chapter presents the study implications, limitations, and suggestions for further.

2 Related research

In this chapter, we describe the key concepts in our study and introduce related research connected to user acceptance and adoption of automation technology. The chapter is divided into three sections: Challenges of technology adoption and use, Automation technology in e-commerce, and Previous research about dynamic pricing robots. The section that outlines the challenges of technology adoption and use is the most comprehensive, covering the main challenges of technology adoption identified by previous research.

2.1 Defining acceptance and adoption of technology

Acceptance and adoption of technology does not have the same meaning. In our context of research, it is important to understand the distinction between the two. Therefore, we will provide explanations of the differences. Technology acceptance is, according to Venkatesh et al. (2003) an attitude towards technology that is affected by several factors which we discuss further in the following sections. If the technology does not become accepted, it is not likely that the technology will be fully adopted (Venkatesh et al., 2003). Adoption can be defined as a process that begins with the user's awareness of the technology by accepting it and ends with users embracing and using the technology (Davis, 1989; Rogers, 1995).

2.2 Challenges of technology adoption and use

2.2.1 Trust

Humans that trust automation are more likely to rely on it (Lee & Moray 1992, 1994; Parasuraman & Riley, 1997). Trust is gained by a combination of different aspects, including positive user experiences of using automation technology that show their trustworthiness. Measuring and conceptualizing trust in technology can be done with different approaches. Typically, with human-like trust constructs or with system-like trust constructs (Lankton et al., 2015).

Trust is one of the most common challenging factors for the acceptance and adoption of automation technology (Lee & See, 2004; Leesakul et al., 2022). If there is a lack of trust users can become hesitant about accepting and adopting automation technology, particularly in critical domains such as healthcare or aviation (Lee & See, 2004). Employees are typically expected to trust information systems (IS) to perform their job, but often this is not the case (Ash et al., 2004). To promote and accept an IS within the workplace the user needs to trust the system first (Silic et al., 2018). Users that trust an IS will be using it and on the contrary, users that do not trust an information system tend to avoid using it. Reliability is an important construct of trust (Sillence et al., 2007; Thielsch et al., 2018). Employees only trust an IS that runs without major faults or errors and meets their work requirements. Even with the best IS implemented, there are risks of people not trusting IS due to perceived poor data quality (Sillence et al., 2007). A previous study of trust in the adoption of systems showed that the expectations of trust differ depending on what kind of technology was intended to adopt, according to Silic et al. (2018).

According to Clark et al. (2016), too much trust in technology can be equally as devastating for technology adoption as too little trust. Technology is now so advanced that users often don't understand how the technology works but they assume it will work. Clark et al. (2016) also suggests that there is a proven overconfidence in technology and the potential effects of technology, especially for new technology. It is important for users to be mindful when making decisions based on beliefs in what technology can accomplish. Excessive optimism and belief that technology will result in success can have negative consequences (Clark et al., 2016).

Research on distrust shows that distrust can emerge from only one problem, and it can be a small one. Through understanding and support of the adoption and use of information systems in workplaces, especially in places where users feel vulnerable because of risky and uncertain work conditions (Thielsch et al., 2018). According to Thielsch et al. (2018), these kinds of feelings can arise from the following typical factors (for many work processes nowadays), such as high potential gains or losses, high levels of personality responsibility, and time pressure or work tasks. It is crucial to use reliable IS that delivers trustworthy information, when using IS within work tasks. If there are flaws related to the factors above, it can lead to distrust among users, which in turn can lead to higher levels of stress and less system use (Thielsch et al., 2018). Furthermore, to enable high levels of trust in the IS, leaders could ensure there are high skills of other involved employees, the technical support is enough, and opportunities of participating in the adoption and choice of the technology (Thielsch et al., 2018). A summary of the main areas previous research has identified for distrust is presented in the three subsubsections below.

2.2.1.1 Lack of user involvement in design

Involvement and participation have proven to be key elements when building trust in automation technology (Thielsch et al., 2018). Automation has become progressively sophisticated through machine learning by resembling human behavior, but automation still relies on human involvement in the context of automation configuration, training, and procedure (Asatiani et al., 2019). Employees must be included to understand the new technology, the purpose and what the impact will be on future work (Asatiani et al., 2019). To deal with this challenge, it is crucial to include and communicate with the users and the organization (Plattfaut, 2019).

2.2.1.2 Training and support

Sethibe & Naidoo (2022) established inadequate investment in automation technology, lack of training, and poor data quality as determinant influencing factors adoption of automation technology. The right resources and tools must be available to support the use of automation technology (Sethibe & Naidoo, 2022). Organizations might also be forced to reconsider the internal roles and skills needed (Gustafsson & Olmarker, 2021). Sufficient training and support will directly strengthen trust. Sufficient support helps raise users' awareness of high-quality data and validates credibility (Thielsch et al., 2018). Facilitating conditions is one of the key determinant factors for technology adoption (Venkatesh et al., 2003; Sethibe & Naidoo, 2022). Facilitating conditions are described as the degree to which users consider that they have fundamental support and resources to use the technology effectively. This can be done through access to required equipment, training, and technical support (Venkatesh et al., 2003).

2.2.2 User resistance

New automation technology that replaces repetitive tasks which users perceive as unskilled are mostly welcomed by users (Zammuto et al., 2007, Newell et al., 2009). However, technology that transforms work tasks can also be treated with skepticism. If misaligned with users' existing expertise and working methods (Bailey & Barley 2011, Anthony, 2018) it is likely to be rejected (Alvesson, 2004, Lapointe & Rivard, 2005). User resistance to automation technology can be a significant barrier to acceptance and adoption (Lapointe & Rivard, 2005; Gustafsson & Olmarker, 2021; Seiffer et al., 2021). A triggering factor for user resistance can be fear of job displacement or fear of losing control due to the automation technology implementation (Lapointe & Rivard, 2005). To minimize resistance, it is important for organizations to include users in the design process and to increase trust in authors (Gustafsson & Olmarker, 2021). In a case study about automated unmanned vehicles at IKEA, the

authors (Gustafsson & Olmarker, 2021) found resistance to be a critical challenge affecting the adoption of new automated technology as managing the potential resistance of the employees. Resistance can be solved by including the workers in the automation projects or by increasing trust in the technology. A summary of main areas previous research has identified to cause user resistance is presented in the two subsubsections below.

2.2.2.1 Fear of displacement

A study in the manufacturing industry found that users could experience a negative effect on their job satisfaction and feel that automation technology would make their job less valuable or cause work displacement (Demerouti et al., 2001). Those negative factors could result in resistance to technology adoption. Leesakul et al. (2022) identified fear of job displacement as one of the prominent challenges and tensions associated with technology adoption. Transparency in communication is critical to address mistrust of RPA and fear of losing jobs (Syed et al., 2020). In a study by Seiffer et al. (2021) fear is identified as the most common theme for employee responses in studies regarding software robots. Employees experience fear both regarding job replacement and job loss but also regarding changes in working habits (Seiffer et al., 2021). To address this, organizations must first understand what tasks RPA is best suited for (Jovanović et al., 2018). The organization must know in what parts RPA is applicable and the capacity of managing different workflows (Syed et al., 2020). When a workflow becomes automated, users are no longer required to be skilled for a particular task as this process is performed by the robot (Ivanov et al., 2020). The result of this could lead to deskilling of current jobs (Fung, 2013) and the re-skilling of jobs (Syed et al., 2020).

2.2.2.2 Negative impact on job satisfaction

Fear of changes in working habits has been identified as a common challenge for acceptance and adoption of automation technology (Seiffer et al., 2021). Users may perceive automation technology as reducing the value of their work or leading to job displacement, which can reduce job satisfaction and increase resistance to adoption (Demerouti et al., 2001; Seiffer et al., 2021). A study by Demerouti et al. (2001) found that negative perceptions of automation technology were associated with reduced job satisfaction in the manufacturing industry. It is a challenge for the employer to match the requirements of the new responsibilities with the skills among the workers (Gustafsson & Olmarker, 2021). Internal roles and skills might need to be reconsidered to fully reach the potential of automation technology (Gustavsson & Olmarker, 2021).

Different external factors can force or prevent behaviors. This is regardless of the individual's intention, but depending on the degree of control the individual possesses (Ajzen, 1991). Changing user behavior can be hard to study, sometimes users can pretend to comply while avoiding the real change. (Pachidi et al., 2021) Introducing new technology in the workplace often changes ways of working and how to organize (Zammuto et al., 2007). Pachidi et al. (2021) found that knowing practices are highly connected with deeper assumptions about best practice or who has the authority.

2.2.3 Technological complexity

Automation technology can be complex and difficult to use, particularly for users who are not familiar with advanced technology. This can reduce user acceptance and adoption of automation systems. A study by Holzinger et al. (2009) found that technological complexity was a major factor affecting user acceptance of automation in healthcare. The perceived ease of use of automation technology is an important factor for user acceptance and adoption. If users find the technology difficult to use, they are less likely to adopt it compared to if users find the technology easy to use (Venkatesh et al., 2003.; FakhrHosseini et al., 2022). One way to address the challenges of technological complexity is to address effort expectations. Effort expectation is explained by Venkatesh et al. (2003) as the degree to which users consider the technology easy to use and requires minimal effort. According to Venkatesh et al. (2003) effort expectations are one of the key determinant factors of user behavior and user acceptance (technology adoption).

2.2.4 Perceived usefulness

The perceived usefulness of automation technology often has a significant impact on user acceptance and adoption (Venkatesh et al, 2003.; FakhrHosseini et al., 2022). If users do not believe the technology will be useful, they are not likely to adopt it (Venkatesh et al., 2003). The construct of trust has a major impact on the perceived usefulness of technology (Silic et al., 2018). Previous research has identified three main areas affecting perceived usefulness: performance expectancy, perceived control and social influence. Performance expectancy is one of the key determinants for technology adoption presented by Venkatesh et al. (2003). Performance expectancy is presented as the degree to which users consider technology would help to accomplish work performance and achieve goals. Users perceived control and self-efficiency are important components in perceived usefulness and thereby adoption (FakhrHosseini et al., 2022). Perceived usefulness is also affected by external variables, such as the social influence of others. Social influence is explained as to what

extent users are affected by other co-workers' actions and opinions (Venkatesh et al., 2003). Social influence is one of the key determinant factors for technology adoption (Venkatesh et al., 2003). Pachidi et al. (2021) describes how actors can respond to undesired change by pretending to comply.

2.2.5 Summary

Multiple previous studies have emphasized the importance of being cognizant of the challenges in implementing automation technology. Previous subsections and sub-subsections in this section highlight that automation technology needs to be user-friendly, transparent, and trustworthy. Organizations and developers need to have these challenges in mind to improve user acceptance- and adoption and thereby also maximize the potential effect from automation technology. To understand the adoption of automation technology, organizations first need to be aware of and address challenges that occur when humans need to adapt, such as the ones discussed earlier in this chapter. Addressing challenges is important for achieving the expected outcome (Anthony, 2018). For organizations, it is also crucial to balance technological change with organizational adjustments (Zuboff, 2019).

2.3 Robot process automation

A search in Scopus database reveals that research about RPA has exploded during the last years and continues to increase. Figure 1 graphically shows the number of documents in the Scopus database containing “Robot”, “Process” and “Automation” in the abstract per publishing year. In the years from 2015 to 2017 below 150 documents were published per year, while in 2021 and 2022 it is more than 350 per year.

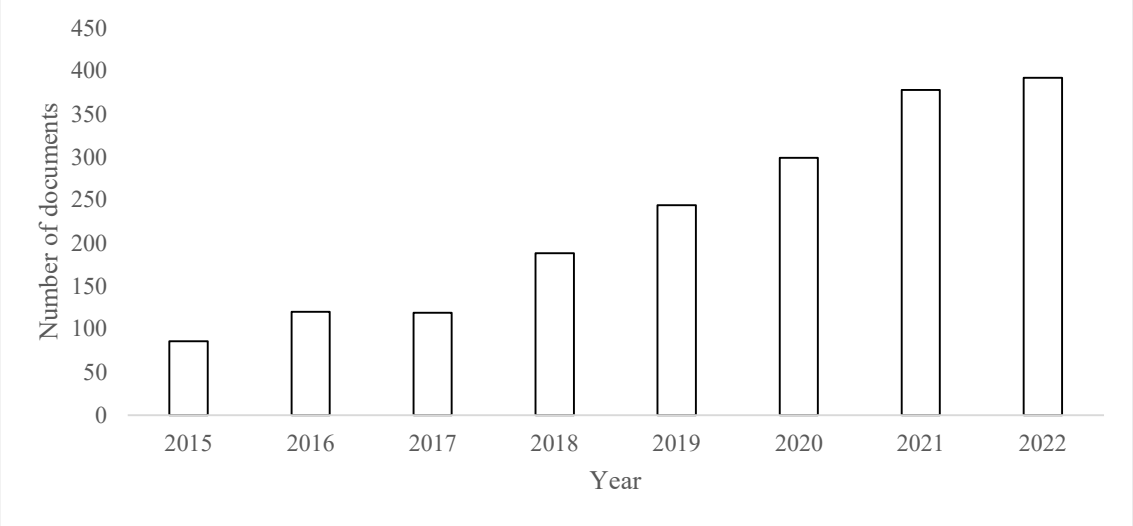


Figure 1. Number of documents in Scopus database containing "Robot", "Process" and "Automation" in abstract per publishing year

Less than 1% of published documents containing “Robot”, “Process” and “Automation” are related to the field of e-commerce according to Scopus database. When applying RPA, it is important to know that all business processes are not suitable for automatization. To fully justify automizing a business process it needs to be standardized, optimized, digitized and without too many exceptions (Siderska, 2021). Organizations usually choose to implement RPA technology when they have known issues related to inefficient manual processes that cost them time and money (Naveen Reddy et al., 2019). RPA consists of repetitive, rule-based, and well-structured tasks. Such an example of tasks can be the transferring of data between applications through screen scraping of different sources which has existed for only a couple of years in the context of RPA (Willcocks et al., 2017). Screen scraping has been used for over two decades in the commercial field (Metcalfe, 1993).

2.3.1 Previous research about dynamic pricing robots

Previous research found in Scopus database about dynamic pricing robots in e-commerce primarily focuses on optimizing strategies and profits rather than investigating user acceptance and adoption. The emergence of the world wide web and the increased knowledge about competitors, customers, and providers has rapidly changed the competitive landscape e-commerce players operate within (Streitfeld, 2016). Consumers are much more aware of prices, and companies' pricing strategies have been forced to improve, which has affected e-commerce companies to incorporate pricing innovation (Streitfeld, 2016; Mohammed, 2017).

Dynamic pricing is the process of automatically adjusting the prices of products or services. Dynamic pricing can be used, e.g., to meet changes in demand or to match competitors’ prices in the market (Christ, 2011). Matching competitors’ pricing in e-commerce can be done through scraping of marketplaces, e.g., google shopping, or specific competitor sites. Prices are then collected, compared, and can provide a foundation for a company’s own pricing. By applying different strategies for groups of products, products receive new pricing recommendations that can be automatically approved and updated. Dynamic pricing is not only software but also a pricing strategy (Christ, 2011). Pricing is often highly prioritized for company management since it directly influences profitability on a large scale. Pricing can be very challenging because it is affected by cost and demand conditions. These conditions are not parallel which makes it complex to align with the strategic goals of the company

(Laitinen, 2011). According to previous research by Aviv and Vulcano (2012) companies in the past did not have the capacity or ability to execute, plan and take advantage of dynamic pricing solutions. Dynamic pricing (in the revenue management field) has increased in the context of affordances in business, human expertise, market data, and technology (Maglaras & Meissner, 2006).

More recent research on the effects of technological advances on the role of management accountants from a Nordic insurance company, found that pricing technology has become more sophisticated in absorbing a great amount of data which has contributed to the specialization of the pricing process (Andreassen, 2020). The pricing process is becoming constantly updated to reflect the data and to model elements of customer and pricing behavior (Andreassen, 2020).

3 Conceptual Framework

In this chapter, we present and motivate our chosen conceptual framework that is guiding the overall study and analysis. We also describe how we have adapted it to fit the purpose of the study. The Technology Acceptance Model 2 (TAM2) by Venkatesh & Davis (2000) and TAM trust were chosen as the initial framework in the early stage of the study. The TAM model has therefore been pivotal in information our data collection and ensuing analysis. However, when we came across the Automation Acceptance Model (AAM) proposed by Ghazizadeh et al. (2012) we deemed that this framework was a better fit for investigating the adoption and use of automation technology. In brief, the AAM model enables an evaluation of how well users adopt new automated technology. In this study, it was also important to predict the challenges users are facing when adopting new automated technology. Thus, the AAM model is a suitable analytical framework for exploring user acceptance/adoption, expectations as well as trust. While TAM provides the foundation for both TAM2 and the AAM, TAM2 adds the dimension of subjective norm and AAM focuses specifically on automation. In what followed we present the framework and how it has evolved.

3.1 The Technology Acceptance Model

The technology acceptance model (TAM) was developed by Davis (1989) to predict how humans accept and adopt new technology. The model helps us understand users' behavior towards technology, which is an important area of research within the information systems (IS) field. In addition, TAM has become valuable in areas of research related to technology implementation. The contribution of the model shows how the relationships between determinants of technology acceptance can be used to predict users' acceptance of technology and the intention to use technology. TAM was originally created from the 'Theory of reasoned action' (TRA) with the purpose of creating a simpler model to use to examine the technology at workplaces. At the core, the TRA model describes and predicts human behavior (Venkatesh et al., 2003). The TAM model adopts two main perceptions, *perceived usefulness* (PU) and *perceived ease of use* (PEU), which are crucial in how information technology will be used. *Perceived usefulness* can be described as how much a user considers that using a specific technology will improve their job performance. The most useful technology is often chosen by workers within information technology since it makes

their job more effective. This is because of the benefits users gain by having an effective job. If users consider their job will be facilitated by technology, the view on perceived usefulness will be positive. *Perceived ease of use* is the extent to which users consider that a system improves their job performance. This said, when users sense something is useful, their view of a system will be influenced by how simple the system is to use. This is affected by the user's opinion regarding if the required effort of using the system outweighs the benefits of using the system. This means users will choose the system that is perceived as the easiest (Davis, 1989).

3.1.1 Trust in the context of TAM

TAM is often extended with trust as a variable to improve predictive power (Lin & Xu, 2022). Adding trust into TAM is particularly interesting to researchers in e-commerce and e-government in the context of the uncertainty and risks within web-based fields. Trust in electronic suppliers determines trading intentions. This is affected directly and indirectly by perceived usefulness, perceived ease of use, and perceived risk (Pavlou, 2003). The TAM model can be used to assess the effectiveness of trust. Attitudes such as trust in automation have a significant role in user acceptance and user reliance (Lee & See, 2004). A result of an inconvenient level of trust can be the disuse or nonuse of automation. This corresponds to inappropriate high-level trust and low-level trust (Parasuraman & Riley, 1997). The relationship and trust in technology evolve in different steps as the users adapt to a new system. It starts from the exposure, with the next step to the innovation, moving on to the adoption decision, and lastly to the decision confirmation (Rogers, 1995). Likewise, the acceptance of automation changing during this time (Davis et al., 1989).

External social factors have an impact on perceived usefulness and perceived ease of use. User automation adoption is influenced by several factors such as effectiveness in automation, trust in automation, autonomy influencing automation adoption by users, and automation´s level of authority. The factors form the following two themes, trust in automation and task-technology compatibility. The two themes can be used as the center of a framework in TAM to evaluate system use and acceptance based on the attitudes, beliefs, and perceptions of users (Ghazizadeh et al., 2012).

3.2 Technology acceptance model 2 (TAM2)

Venkatesh & Davis (2000) published a proposed extension of TAM that explains perceived usefulness. TAM2 extends the original TAM model by showing that subjective norm exerts a significant direct effect on usage intentions. Subjective norms

entail social influence on users, such as the influence of people around them (Holden & Karsh, 2010; Venkatesh et al., 2003). They found that when individuals gained direct experience in a system over time, they relied less on social information in forming perceived usefulness (Venkatesh & Davis, 2000 p. 187).

The definition of subjective norm is:

> *"person's perception that most people who are important to him think he should or should not perform the behavior in question"*

Davis et al. (2000) found that subjective norm had no significant effect on intention, and therefore was not in the original TAM model even though it existed in TRA model. When respondents have been separated into mandatory and voluntary user contexts a significant effect from the subjective norm was found in the mandatory setting but not in the voluntary. According to Venkatesh & Davis (2000 p. 188) voluntariness is defined as:

> *"The extent to which potential adopters perceive the adoption decision to be non-mandatory"*

When having a compliance-based approach to introducing a new system, they appear to be less effective over time than when using social influence to target positive changes in perceived usefulness. (Venkatesh, & Davis, 2000) A limitation of TAM2 is that the authors used self-reported usage (Venkatesh & Davis, 2000).

3.3 Automation Acceptance Model (AAM)

Automation adds more dynamic layers to technology and can present specific challenges for adoption. Ghazizadeh et al. (2012) propose the Automation Acceptance Model (AAM) as an extension of TAM. The added layers make the model more fit for understanding automation acceptance and provide a broader view of automation acceptance and adoption. The AAM is illustrated in Figure 2, where the initial constructs from the TAM model are illustrated in grey areas.

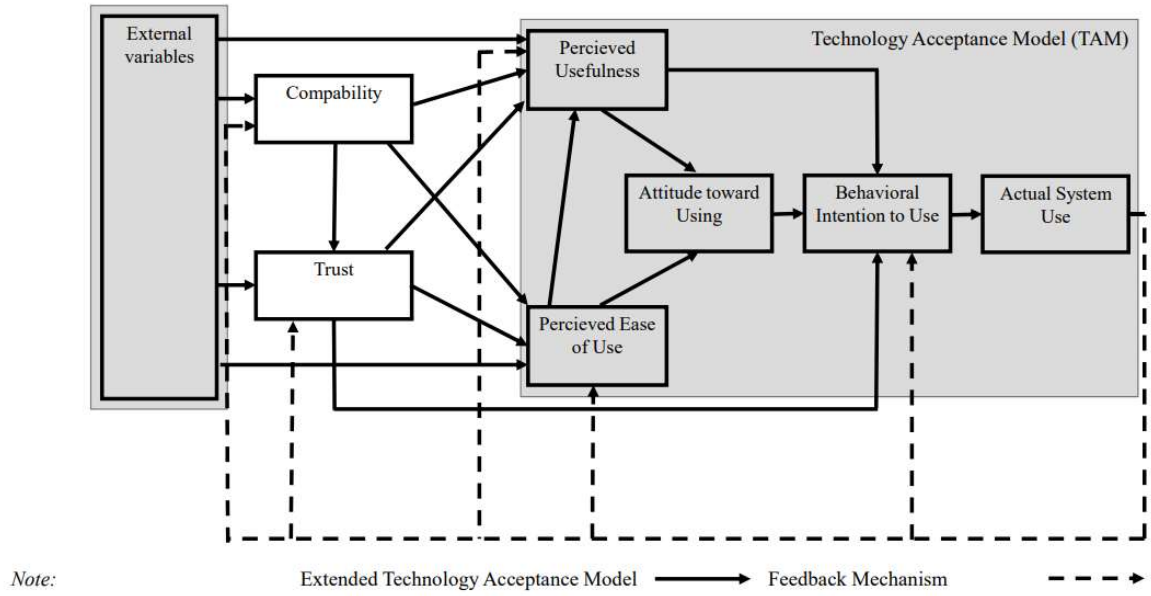


Figure 2. The Automation Acceptance Model

The dynamic nature of automation technology and its adoption process is captured through feedback mechanisms. As a complement to TAM, AAM adds research from cognitive engineering (CE) to study automation acceptance. In the CE literature task-technology compatibility is a major determinant of automation acceptance. The AAM framework combines constructs from TAM and CE literature, with TAM as the base. Ghazizadeh et al. (2012) concluded that high-level performance of automation technology did not guarantee acceptance or actual use. Therefore, they suggest that analyses of preferences and attitudes should be inseparable components of automation evaluation. Trust is also identified as an important influence of acceptance. Task technology compatibility is another important factor. The underlying dynamic for social norms and how they influence the perception of automation remains unexamined (Ghazizadeh et al., 2012).

A related factor for acceptance is previous use. The greater the consistency between automation and users' previous experiences, the more likely they are to adopt new technology (Dishaw & Strong, 1998). AAM's compatibility structure incorporates these ideas. The impact of perceived compatibility on attitude toward use is mediated by perceived use and perceived ease of use (Dishaw & Strong, 1998). In addition, compatibility has a direct impact on trust. Trust is considered a key influencing factor when using electronic information systems and e-commerce (Pavlou, 2003). Trust has an impact on automation. This is also confirmed in Ghazizadeh´s et al. (2012) study of AAM which suggests that trust directly affects behavioral intention to use, and indirectly through perceived usefulness and perceived ease of use. AAM is a

dynamic bidirectional process. Past system experience affects the users' view of the system, and that in turn affects future interactions. AAM presents this adaptation process as previous system use affects the level of compatibility perceived by the user, trust in automation, behavioral intention to use, perceived usefulness, and perceived ease of use.

The model suggests that the relationships of the components in the model often affect automation acceptance. The model does not on the other hand assume that all effects have an influence on all automation purposes. The external factors improve the generalizability of the model, which enables the incorporation of the aspects of the human-automation interaction. The AAM provides a more comprehensive view for evaluating automation acceptance, by considering the following variables along with task technology compatibility, trust in automation, ease of use, perceived usefulness, and the influence of previous system use (Ghazizadeh et al., 2012).

Ghazizadeh et al. (2012) suggests further study the process of automation acceptance. It is suggested that e.g., survey questionnaires are administered at several points in time, and to measure actual system use through system logs during transition periods.

Although Ghazizadeh et al.'s (2012) proposal of AAM has received significant citations, it has not undergone through evaluation in previous research. Hence, there is a requirement to assess the applicability and significance of this model both in research and practical context. On the other hand, there is no studied critique of the model to consider, other than the researchers' own stated criticism. Our study contributes new knowledge on technology user adoption through the AAM model. In this context, the framework makes our study unique and provides new insights into the challenges in technology adoption. The lack of research within this area also forced us to be extra critical of the chosen framework.

4 Method

This chapter presents the methodological approach and the qualitative research settings for the case study. The approach has changed during this study due to unexpected results in the pre-study. This will be further explained in this chapter. The first part describes the research approach, and the second part describes the settings at the company. The name of the company will remain anonymous due to privacy reasons. "The company" will be used throughout this thesis.

4.1 Research approach

To answer the research question, this study was conducted with a case study approach (Bryman et al., 2019) using both qualitative and quantitative data. The method was chosen to enable studying the phenomenon in-depth and within a real-world context (Backman, 2016).

4.1.1 Research process

In the initial phase, system trust was chosen as the main research area. After the pre-study was completed, which was before the interviews, it became clear that system trust was not the main parameter affecting the actual use. Instead, we decided to study which factors affected system usage from a user perspective. Once the field of study changed, we also decided to change the conceptual framework. This is the reason why survey questions were based on TAM and TAM2, while the analytical framework used for presenting results is AAM. Considering AAM was developed from TAM the models work very well together. This case study was conducted to identify the different mechanisms and underlying variables that influence the outcome when replacing the dynamic pricing robot.

4.1.2 Data collection

Ghazizadeh et al. (2012) suggested further studies regarding automation adoption should include survey questionnaires at multiple points in time and actual system logs. This study encompasses surveys, semi-structured interviews, data from system logs and informal observations at the case study setting spanning nine months. Semi-

structured interviews account for most of the data collection (Bryman et al., 2019). This collection method was chosen to allow a more open dialogue with the respondent to ask unplanned questions. This approach provides a deeper understanding of the respondents' experience (Bryman et al., 2019; Elliot et al., 2016; Hennink et al., 2020). The study was conducted from August 2022 to April 2023.

Before and after the actual system implementation was completed, two identical surveys were conducted to identify relevant areas for focus (see Appendix 1). The surveys have acted as a complement to the study. Although it was superficial, the surveys were an important step to get a deeper understanding of the problem area and the experienced challenge. It helped identify problem areas and sharpen the research question. The identical surveys for evaluation of Robot 1, and Robot 2 were completed by all category managers. The survey was divided into six different areas based on TAM, TAM2, and TAM extended with trust, which was the selected framework at this stage of the course. A total of 23 questions were answered per survey. The following six areas were identified; Perceived usefulness (PU), Perceived Ease of Use (PEU), Attitude Toward Using (ATU), Behavioral Intention to Use (BIU), Trust (TU), and Subjective Norm (SN). For each question, and for each area an average score was calculated on a scale from 1-5. The scale is found in Appendix 2.

To gather the data for the case study seven key persons at the company were identified to perform semi-structured interviews. Category managers and managers of the project were chosen for the interviews. The interviews were conducted both during and after the go-live process. The seven participants were interviewed separately. All interviews were conducted in February 2023 and lasted 30 – 60 minutes. The interview questions can be found in Appendix 3. Two interviews were held via Microsoft Teams and five physically at the company. The completed interviews were recorded and later transcribed. Six participants have been working with both Robot 1 and Robot 2 while one participant has not been working with Robot 1. Following employees at the company was interviewed (see table 1):

Table 1.
Overview of interviewed employees at the company

Title	Role in project
Head of Pricing and Analytics	Project manager
Head of IT	Project Owner
Category manager 1	Core project participant
Category managers 2,3,4 & 5	Project participants

Informal observations have been performed at the company throughout the implementation process. What has enabled this is that one of the authors has been employed at the company since the beginning of 2021. This has granted us access to information and employed users that otherwise would have been difficult to access, although it also may also have compromised the study results. To mitigate this, we have ensured that the author, who has no relation to the company, carried out the interviews. The observations were conducted to capture the culture of the organization. This involved the authors observing and taking notes during workshops, implementation-related meetings, and day-to-day work that could be used to the analysis.

Collection of actual user data from system logs directly from both Robot 1 and Robot 2 was made. The exact same datapoints were not available, but similar enough to draw conclusions on behavior and behavioral change.

Collection of data from the company's ERP has also been made. What has been measured is the number of articles affected by dynamic pricing.

4.1.1 Analysis of data

Through a qualitative data analysis, we analyzed the data which enabled us to start making sense of the materials, create a thematic display, and progress with the interpretation (Bryman et al., 2022). We chose to use thematic analysis since it is an approach used for comprehending and decoding the information from the collected data and afterward categorizing it into themes (Bryman et al., 2022; Denscombe & Larson, 2018). These themes are visible and emerge through various means, such as identifying recurring patterns, examining differences or similarities, indigenous categories, or typologies, employing analogies or metaphors, observing transitions, along with paying attention to repetitions and transitions found within the collected data (Bryman et al., 2022).

The initial phase of the analysis was to transcribe informal conversations to deeper understand the phenomenon and become familiar with the data (Bryman et al., 2022). The coding allowed us to change or refine the theory used in the analysis process as new categories and codes evolved. By using existing categories and codes to help build or extend knowledge we could summarize the most important findings (Bryman et al., 2022; Denscombe & Larson, 2018). In the final phase, conclusions were drawn and formed, enabling the answering of the research question through the identification of the themes, analysis of the explanations for observed patterns and relationships and making meaningful comparisons (Bryman et al., 2019).

4.2 Settings and Participants

4.2.1 Case settings

The study takes place at an e-commerce company selling premium kitchen appliances online. The company has during this study replaced their dynamic pricing robot with a new dynamic pricing robot from another supplier. From here on in this study, the previous dynamic pricing robot will be referred to as "Robot 1" and the new dynamic pricing robot will be referred to as "Robot 2". The company is one of the leading players in the Nordics in this segment, active in Scandinavia and Finland. The assortment currently consists of 21 000 unique articles active on each website, and each website has a unique price point and currency. This means there are 84 000 price points in total that need to be maintained. There are many players in the market selling the same products and brands, and with price comparison easily available online price matching is often necessary to get conversion. The purchase department, and the company's category managers are responsible for this. To save valuable time from category managers that are responsible for sales prices, the company uses a dynamic pricing robot to automatically change prices based on competitive situations and conversion levels. However, Robot 1 did not work as expected.

During the past two years the company has reviewed many different suppliers of dynamic pricing robots and realized that costs could be cut. It is also described as an opportunity to restore trust in dynamic pricing from category managers and the rest of the organization. In August 2022, an agreement was signed between the company and the chosen new supplier of dynamic pricing robot, and a project management team was formed. The core team of the project consisted of 4 people from the company, see table 2.

Table 2.
Internal project team at the company

Title	Role in project
Head of Pricing and Analytics	Project manager
Head of IT	Project Owner
Category manager 1	Core project participant
Performance marketing specialist	Core project participant

The main role of the internal project team was to define tasks to be done internally and prioritize development projects for the external group. For communication of

prioritized tasks internally, a project group with external parties was created (see table 3). The main purpose of this group included:

1. Plan and execute technical implementation.
2. Work on important tasks prioritized by internal project groups.

Table 3.
Internal / External project team at the company

Title	Role in project
Head of Pricing and Analytics	Project manager
Head of IT	Project Owner
Application manager ERP	Project participant
ERP Consultants	Core project participant
Price tool representative	Core project participant

The company has three main behavioral changes desired to be accomplished by changing pricing tool and changing pricing strategy:

1. By increasing confidence among category managers, the company wants category managers to work more independently and be more creative.
2. By increasing trust, category managers should spend more time on development and innovation instead of using other tools to double check information. Usage should increase in terms of conducted analysis.
3. By enabling and implementing a new model for support:
    a. Remove personal dependence from Head of pricing and analytics that is currently the only link to consultants.
    b. Solving problems faster through a dedicated customer service function that is always available.

4.2.1.1 Organizational turbulence

This study takes place during a turbulent time for the company. The implementation started in august 2022, and there were six category managers working in the purchasing department. Out of these six, only one had been employed for more than two years. Two of the six did not have a permanent position, and by the new year, there were only five category managers. The category manager team was therefore still setting internal processes and ways of working, which impacts implementation processes in both favorable and less favorable ways.

During the autumn of implementation (2022), sales were not at the levels expected. The company lost revenue both compared to internal figures last year and compared to market data. The lost revenue combined with a very tough competitive situation caused the company to struggle with profitability issues. This led to tangible stress internally, and additional pressure on many employees. Especially the ones responsible for margin (the category managers in the purchasing department). In December 2022, it also became official that the company's CEO decided to resign. In her place, the manager for the purchase department acts as interim CEO while searching for a permanent solution. It was also made official that the CTO has decided to resign. He left his position in February 2023, after the implementation was done.

4.2.2 Dynamic pricing robots

The difference between Robot 1 and Robot two can be simply explained with a car example. Robot 1 is equipped with a strong engine and advanced functionalities, like a fast Ferrari car with steering wheel paddles. The problem is that rarely no one in the organization knows how to drive it and does not understand all functionalities. The complexity makes category managers uncertain about where pricing recommendations come from and why it behaves in a certain way. Robot 2 is more like an automatic new Volvo. The engine is not quite as strong, but everyone is familiar with the car, it feels secure, and the category managers know how to steer it with confidence.

Both Robot 1 and Robot 2 are SaaS products from companies specializing in competitive pricing surveillance. There are various kinds of dynamic pricing solutions and tactics, e.g., pricing based on demand, price discrimination (different prices for different customer groups) and competitor-based pricing. The pricing solution used by the company that was studied is competitor-based pricing. The technology is primarily used by e-commerce and omnichannel retailers in need of constant competitor surveillance and price matching (Andreassen, 2020; Metcalfe, 1993). Both solutions are off-the-shelf, with the possibility for some customs adjustments. Robot 1 offers more opportunities in terms of adjustments, but it requires advanced programming skills. Both solutions can be described as follows: By using the product Global Trade Item Number (GTIN) numbers, the pricing optimization software scrapes competitors' prices from e.g., Google Shopping and specific retailers web sites. In the robots, the company can create strategies based on product attributes or performance. Based on different strategies, the company can price products differently. Competitors' pricing can be used as a base for the company's pricing, but also actual product performance. The process used by the company for automated price updates, and many others, are described in steps in Table 4 below:

Table 4.
Steps in dynamic pricing process

Step 1.	Sales prices from ERP (Enterprice Resource Planning system) are sent to dynamic pricing robot every 6 hours. Currently sales prices and product information are sent by XML files, automatically generated.
Step 2.	Sales prices from ERP are matched against competitive prices. Competitive prices are scraped based on GTIN for all products once every 24 hours.
Step 3.	Sales prices change, or remain the same, based on the strategies set in dynamic pricing robot. Strategies e.g., be to maintain price, match competitor price or be set to a fixed margin.
Step 4.	New and updated sales prices are sent back to ERP and updated every 15 minutes.
Step 5.	Sales price in ERP is automatically transferred to Web, this happens within a few minutes.

The primary function in both systems is competitor price surveillance, but they also offer other functionalities. Both systems offer analytical opportunities combining pricing data and google analytics data. Users can build their own dashboards and access data not currently available in ERP or BI tools. The analytical parts in both systems can provide crucial information for category managers that can be used, e.g., before supplier meetings to indirectly check how competitive prices the company have.

4.2.3 Ethical considerations

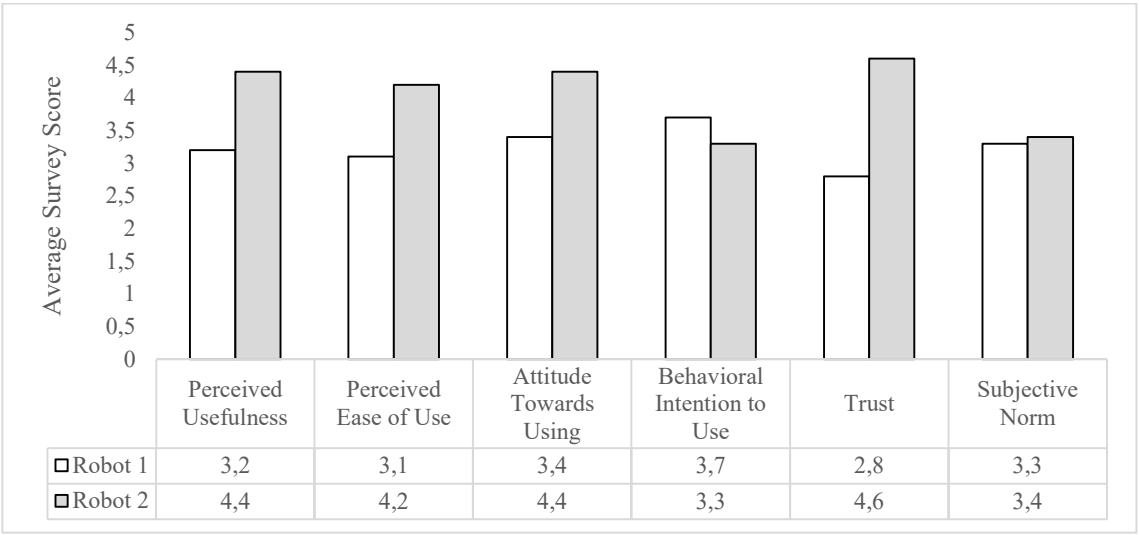
One of the authors was already employed at the company in the beginning of the study, meaning some bias and presumptions cannot be avoided. To avoid this as much as possible, the other author performed all semi-structured interviews and handled the answers anonymously.

5 Findings

This chapter presents the findings from the pre-study, the semi-structured interviews, informal observations, and from system logs. The first section presents findings from the pre-study, that guided the direction for the other parts and are constructed according to the dimensions of TAM 2 and TAM extended with trust. The theoretical framework chosen, AAM (Automation Acceptance Model), is an extended version of TAM (Technology Acceptance Model) by Ghazizadeh et al. (2012). This framework was chosen after the conducted pre-study. The second section presents results from in-depth interviews and informal observations at the workplace structured by the components of AAM. The third section focuses on the data from the system logs that have been collected in both the old and new dynamic pricing robots.

5.1 Findings from Pre-Study

At the initial phase of this thesis, a pre-study based on a survey was performed. The survey was conducted twice by all the category managers, once for Robot 1 and once for Robot 2. The results from the conducted pre- study are summarized in a bar chart, see figure 3.



	Perceived Usefulness	Perceived Ease of Use	Attitude Towards Using	Behavioral Intention to Use	Trust	Subjective Norm
Robot 1	3,2	3,1	3,4	3,7	2,8	3,3
Robot 2	4,4	4,2	4,4	3,3	4,6	3,4

Figure 3. Comparison of Survey results regarding Robot 1 and Robot 2

Robot 2 received higher scores in all areas except for one – behavioral intention to use. Subjective norm was the area that scored most similar in previous vs new system. The reduced behavioral intention to use was very surprising to the authors. The company managers believed the behavioral intention to use should increase once trust and perceived usefulness increases. One of the major reasons for the company to change dynamic pricing robot is to increase usage. Surprisingly, the opposite effect seemed to occur. These early results displaying that trust did not seem to directly alone affect the behavioral intention to use made the authors think again about the chosen theoretical framework. Questions were raised about whether TAM2 was the best framework for this study analyzing automation technology. The authors therefore decided to change the framework to the Automation Acceptance Model.

5.2 Findings from interviews and observations

In this section, we present findings from the semi-structured interviews and observations. Results will be presented based on the components of the AAM framework. Results will be described based on two different user groups (see Appendix 2). The reason for this is that the results from semi-structured interviews varied between the two user groups.

5.2.1 External variables: Sufficient resources and communication

During all interviews with category managers, it was highlighted that the current workload was very heavy. Below is a quote from one of the category managers during the semi-structured interviews when asked about what has been positive and negative during the implementation of Robot 2:

> *"There are many different work tasks that should be done in the role of category manager. Therefore, it has been hard to take the time for Robot 2 no matter how important it is. I believe many of us have found it very exhausting and timeconsuming to start working with Robot 2 even if it is important."*

It was confirmed by all participants that the workload was not heavy due to the implementation of Robot 2. Sales performance was down, directly influencing how the category managers worked with their prices. When sales performance is down, a common action from category managers is to take control of pricing, and manually more aggressively price important products; this directly affects the behavioral intention to use and thereby the actual system usage. The general management also decided to simultaneously change the pricing tool also remake the entire pricing strategy. The project management team describes that there is a history in the company of making too many changes at the same time, preventing them from drawing any conclusions. Category managers were not included in this work, and experienced both confusion and exclusion.

5.2.2 Compatibility: The dynamic pricing robot is necessary to remain competitive

Dynamic pricing in general is not only compatible with the daily work of category managers, but a necessary automation robot to be competitive in the market. Not one of the category managers would like to stop working with dynamic pricing. Compatibility with technology is described the same for Robot 2 as for Robot 1. One of the category managers describes it as follows during the interviews when asked about opportunities through automatization, in terms of pricing:

> *”We are dependent on automatization. Everyone uses automatization. It would have been impossible for us to keep up if we didn’t use automized pricing.”*

Not one of the category managers questioned if the company should work with automatic pricing or not, everyone shared the same picture.

5.2.3 Trust: The importance of trust

During the interviews when comparing Robot 1 with Robot 2 it was stated that category managers trust Robot 2 more. The main reason for increased trust was improved user-friendliness and more competitor matches, category managers can in Robot 2 easily understand price strategies and price points. In Robot 1, category managers experienced missing products, missing competitor matches, and mistrust towards the generated price points. Below are comments from two of the category managers during structured interviews:

> *“For me, the most important thing in a pricing robot is that it finds competitors. Robot 1 did not even do this right.”*

”I feel safe that the robot (Robot 2) does the job. It has been a week since the final implementation, and I feel very secure. The implementation was smooth. I have participated in ERP implementations at other companies before and it has been chaos.”

Correct pricing is important for category managers since profit is their main Key Performance Indicator (KPI). The mistrust toward Robot 1 has led to the use of alternative manual solutions. One described manual workaround is to manually one by one check prices for products at the Swedish price comparison website “Prisjakt.se.” The estimated time spent on this is remarkably high, but category managers still believe it is worth it because they feel more confident and in control of the price. From the project management perspective, manual price points are a major issue for the company and describes it because of mistrust. Multiple analyses show that products removed from dynamic pricing are the product group where the company loses the most sales and profit.

5.2.4 Perceived usefulness: Different views of success

The perceived usefulness in both Robot 1 and Robot 2 has a significant impact on the use and adoption. Category managers describe a higher feeling of control and security in Robot 2 than in Robot 1. The system is more transparent. This improves self-efficiency since category managers don’t feel the need to double check prices set by the dynamic pricing robot. Usefulness in terms of user-friendliness and control is thereby a success, but another important construct of perceived usefulness is sales performance. One of the key goals for the company by changing pricing robot is increased sales. There is a clear difference between the category managers’ opinion on performance and the general management. Category managers expressed disappointment during the interviews because sales are not increasing as expected. Below is a quote from one of them during the structured interviews:

“It seems like the implementation has been a success, at least from what I know. However, it has not generated the desired effect on sales, so that is my concern right now. I am not sure what could have been done differently.”

The project management and general management expressed great satisfaction with the sales performance since it is not as negative as before going live. Below is a quote from the project manager regarding sales performance:

“We are very happy with the sales performance so far. The comparison figures are still negative compared to last year, but not as negative as before. We have also increased the average margin significantly by

changing margin limits in certain price buckets and thereby changing the sold product mix. I am very satisfied."

5.2.5 Perceived ease of use: User experience is crucial

The perceived ease of use is higher in Robot 2 than in Robot 1 both according to the category manager and the project management. Robot 2 is less complex than Robot 1, and prices are much easier to understand and trust. Below is a quote from the project management, also from the interview session:

> *"The old system was very complicated, and hard for category managers to use. The new system is much more user friendly and easy to understand. Once we have established new routines and are comfortable with the new system, I hope we will see more active usage than before. That time spent on errors and manual prices will decrease, and time spent on supplier monitoring and competitor analysis will increase."*

There are high expectations from project management and general management that the increased user-friendliness of Robot 2 should increase the actual system usage.

5.2.6 Attitude toward use: Uncertainty about mandate and role

During the implementation process, almost no resistance against the system was detected. All category managers participated in multiple workshops learning the system and discussing strategies for the future. During the semi-structured interviews, it became clear that expectations differed across the different roles at the company. Below is a quote from one of the category managers during an interview:

> *"… I believe many expect that you should use the tool more than you do. They probably did in Robot 1 as well. There is a reason you use a robot. When the robot works well with good competitor matching, I don't feel that we are going to use the system in that way. As it becomes better, there will be more opportunities to develop and in the long term generate more sales and better profit without any work from category managers."*

In the interviews, the category managers have expressed that they probably are aware that the general managers' expectations regarding the amount of time spent on Robot1 are not fulfilled. It also became clear that there were some uncertainties about the testing and validation process. This was one of the main areas of improvement

according to most category managers. Many of the category managers were unsure about how to perform the tests and did not receive the information they needed beforehand to do the tests with confidence. Tests were done by matching large Excel files, and many category managers did not feel that they had the right competence for this. Below is a quote from one of the category managers when asked about challenges of the new dynamic pricing robot:

> *"I haven't experienced any challenge or knowledge gap regarding the pricing process. But I did feel a knowledge gap during the validation process. I am not very good at excel compared to others. Perhaps I was not the right person to do the testing but I did and now I know how to do it."*

During the testing process, the project management detected resistance from the category managers regarding testing. There was some uncertainty about roles and mandate, and how the workload should be divided between the project management and the category management. The general expectations from the category managers were that they should have the new system delivered and validated from the project management team while the project management felt the need of including category managers to ensure correct information and relevance.

5.2.7 Behavioral intention to use: The dynamic pricing robot makes room for other tasks

The picture of success communicated by category managers during interviews is that they should be able to trust the system to the extent that they do not need to use it. It is expected that the head of pricing and analytics should set correct margin limits for all pricing strategies. There is a clear uncertainty highlighted during interviews both from the category managers and from the project management regarding responsibility. The perception of responsibility varied a lot between participants. Some category managers wished to be very included in the general pricing strategy since they are responsible for their margins, but others wanted to be very little involved. Depending on the level of desired involvement behavioral intention to use varies. There is also some expression during interviews of wanting to spend more time on other tasks. Below is a quote from one of the category managers during interviews:

> *"The most important thing for us is saving time. That we spend our time doing the right things that matter. Not manually correcting prices, it takes a long time and is not efficient. Now I feel secure that the robot does the job."*

Some category managers even expressed direct resistance towards more use and expressed the desire for additional resources. See quote from category manager during interview below:

> *"... in a dreamworld, when we have reached multiple billions in turnover, perhaps there are more people working only with this strategically. Right now, I don't think we need to spend more time in the tool."*

The desired state of category managers is very different from what is communicated from general management and project management. One of the main expectations as an outcome of better pricing robot is a greater intention to use.

5.2.8 Actual system use: Misaligned expectations

The actual system use in both Robot 1 and Robot 2 varies among the category managers. In general, the ones who desire to be involved in the pricing strategy are active users while the others are not. One of the category managers even describes Robot 1 as below:

> *"To be honest I did not use Robot 1 at all. I almost never used it. I have tried to work very proactively to avoid it. I don't like the system at all, it is not flexible. Therefore, I like Robot 2, because it is more flexible. Now I use Robot 2 before supplier meetings to get statistics on a brand level and get an easy overview. Really useful."*

Most of the category managers felt that they, with the new tool, can prepare for supplier meetings with facts instead of assumptions. This is something new that was not available in Robot 1. However, not everyone used the new available features. Even with the increased perceived ease of use and perceived usefulness, some category managers continued to use the system in the same way as before. Below is a quote from one of the interviews:

> *" For me, ways of working have not changed at all. We had some additional files we could use in Robot 1 that we don't access in Robot 2. But I hope we will get this. Robot 1 is better because you get better matches, but ways of working is exactly the same."*

The expectations from the general management team on actual usage are higher in Robot 2 compared to Robot 1. Even though the system changes in the long term it will save the company money. The implementation is in the short term a huge investment of time and money. The expectation is that when users start to use the new

tool and understand it, they will start to automatically use it more because they like it and trust the new dynamic pricing robot more than the previous one. The general managements' expectation is that time saved on manual monitoring will be reinvested in the development of strategies and analysis.

5.2.9 The role of ownership

A component not part of the AAM model but highlighted during the process and interviews was the lack of ownership among category managers. Some category managers expressed during interviews that they were not that involved in the implementation process or in the decision process, but clearly expressed that they did not want to be either. Below is a quote from one of the category managers:

> *"It appears that the implementation has been a success, at least from my point of view. I am not that involved. We haven't seen the effect we wanted in sales, so that is my concern. I do not know what could have been done differently since I was not involved in the implementation process. I only get information about what happens, new rules here and there. And what new rules and strategies that are active. In that part I do not feel involved, but I don't want to be. It is good that we have other people working with this and are good at it. Good that you get the information you need."*

There is a clear lack of ownership in the above statement, and a clear expression of not wanting any ownership. It was hard for category managers to focus solely on testing, other urgent tasks were distracting and some insecurity about exactly what to do was detected. Below is a quote from the project manager:

> *"I felt unsure about what tasks I should do and what the category managers should do. I tried to involve category managers throughout the process. I hope that category managers will be more active in the pricing tool in the future. Expectations from my manager is that they should be involved when changing margin limits since it affects product margins, and thereby profit."*

There is no clarity on what tasks should be delegated to category managers and what should not. Both the Project manager and Project owner describe how the heavy load of implementation preparation takes place during Q4 which is the most important sales period. Q4 is the months of October, November, and December when Black Week and Christmas sales peak. Neither the project manager nor the project owner has a formal management role over category managers. This means that they do not have any insight into or mandate to alter the current workload.

5.2.10 Summary of results from interviews and informal observations

5.2.10.1 Provide the right tools for success

Time and timing of implementation are highlighted as a critical factor from both category managers and general managers. During Q4, when all preparations are made for the go-live in January, is the busiest and most important sales period during the entire year for the company. Category managers were very pressured on time and did not experience any expectations in terms of participation in the implementation project. Instead, they waited for the finalized solution to be presented in January. General managers experienced the need for participation from category managers. It was very important to build engagement and trust in the new tool. However, with category managers' busy schedules it was hard to set a time for this.

5.2.10.2 Align expectations and communication

Category managers and general managers have remarkably different pictures of success when it comes to usage. For category managers, the new dynamic pricing robot is a perfect opportunity to save some time in their busy schedules and reallocate to other tasks. For the general managers, they hope that the time saved will automatically lead to more analysis of the available data.

The importance of increased sales, and a sense of urgency, is communicated both by category managers and by general managers. The company is like many other e-commerce retailers experiencing challenges with both revenue and profit post covid. The system change is described as one of the keys to resolving the situation by all parties, but the interpretation of the outcome differs. From a category manager's perspective disappointment is detected. All that express disappointment also express that they are aware that it can take time before you get the full effect. However, when interviewing the Project manager, the results are described as positive. Revenue, profit, and profit percentage are all up from previous periods even if the comparison from last year is still negative. So, the figures have gone from highly negative to less negative. The interpreted business value varies across the organization.

5.2.10.3 Ensure a sense of ownership

The lack of ownership among category managers proved to be very problematic. Without a sense of responsibility or desire of responsibility, the project management

team struggled to build engagement- and thereby acceptance and adoption. All project participants, both category managers and project management, felt unsure about tasks and responsibilities. This caused unnecessary tension in the project and made certain parts take too much time.

5.3 System logs: Actual Usage

In this section findings from internal company data and system logs are presented. Actual usage has been measured in two different ways to cover different perspectives of use. The first subsection measures usage as the number of items currently triggered by the dynamic pricing robot. The second subsection focuses on actual time and days spent in the old tool vs. the new tool.

5.3.1 Number of items triggered by dynamic pricing

Category managers have two options when it comes to setting prices for their products. One alternative is to manually price the product for all markets in the ERP, and the other is to let the dynamic pricing robot set the price based on current pricing strategies. In this section, "usage" is measured by the total number of items that are triggered by the dynamic pricing robot. The company stores snapshots of the number of items excluded in the dynamic pricing robot weekly. The number of items excluded in the dynamic pricing robot is not only affected by how category managers choose to use the system but also by campaigns. During campaigns, products are automatically excluded. The sales and campaign cycle are heavily influenced by season, and therefore it is suggested that comparisons are made towards the same period last year. The end of March has been chosen as a reference period because during this period the same campaigns as last year were running with approximately the same number of products. We validated this through the company's campaign data, in total the diff was less than 5%. When comparing the number of products excluded in dynamic pricing it has increased from last year (see Table 5). This implies lower usage of the system compared to last year.

Table 5.
Number of items not triggered by dynamic pricing on category level

Category	Excluded items 2023-03-24	Excluded items 2022-03-25	Change vs. LY
1	2463	548	349%

2	245	394	-38%
3	518	86	502%
4	226	157	44%
5	226	487	-54%
6	317	645	-51%
7	526	801	-34%
8	91	82	11%
9	146	61	139%
10	249	344	-28%
Total	5007	3605	39%

When comparing this over a longer period of time, we see that the trend with more excluded items started before the implementation of Robot 2 but has not improved after going live. In Table 5, categories have been coded for anonymity. Results vary across different categories. Categories were mapped to the five category managers, but also for categories run by the same category manager there were big variations, and not in the same direction. One conclusion was made, the large increase in excluded items for "Category 1" was due to a vacancy among the category managers at the time. "Category 1" was split among the rest of category managers, and no one felt ownership. We were not able to draw any other conclusions based on excluded items.

5.3.2 Estimated use in the robots

We have been allowed access to system logs and user statistics in both the old and new dynamic pricing robot. The data we accessed on the two different systems does not have the same structure, and we did not gain access to the suppliers' exact calculations. Therefore, we have made some assumptions, all are disclosed in the text below. Users in the following subsubsections are referred solely to category managers.

5.3.2.1 Actual usage in Robot 1

Users have been employed at the company for different amounts of time. In Table 6, data exported from Robot 1 is displayed together with company data of employment date. The old dynamic pricing robot was launched 2018-01-01 and therefore that is the first employment date. Data was collected on the last day of testing before the Christmas Holidays.

Table 6.
Actual user statistics from Robot 1 from 2018-01-01 until 2022-12-23

Code	Last session	Current date	Days since last session	Date of employment	Average sessions per day
CM 1	2022-12-15	2022-12-23	8	2020-10-01	0,42
CM 2	2022-12-23	2022-12-23	0	2021-09-01	5,35
CM 3	2022-12-22	2022-12-23	1	2022-02-01	2,85
CM 4	2022-12-22	2022-12-23	1	2021-11-01	0,44
CM 5	2022-12-08	2022-12-23	15	2018-01-01	0,31

As illustrated in the above table (table 6), the two category managers that have been employed by the company the longest (CM 1 and CM 5) use the dynamic pricing robot the least. This is interesting, since according to AAM actual system use should generate a feedback mechanism triggering more system use. CM 1 and CM 5 are the ones that in total have spent most time in the system. Most category managers continue to use Robot 1 during the testing period of Robot 2, as seen in Table 7.

Table 7.
Actual use of Robot 1 during second testing period for Robot 2, collected 2023-01-05

Code	Last session	Current date	Days since last session	Date of employment	Average sessions per day
BA	2023-01-05	2023-01-05	0	2021-02-22	1,46
CM 1	2022-12-15	2023-01-05	21	2020-10-01	0,41
CM 2	2023-01-05	2023-01-05	0	2021-09-01	5,23
CM 3	2023-01-05	2023-01-05	0	2022-02-01	2,75
CM 4	2023-01-04	2023-01-05	1	2021-11-01	0,43
CM 5	2023-01-04	2023-01-05	1	2018-01-01	0,31

5.3.2.2 Actual usage in Robot 2

In Robot 2, it is not possible for the company to track actual usage in terms of sessions. However, the company can track actual use with color codes in data provided by the supplier and days since the last session. Colors do not represent an exact

amount of views/ uses in a certain time. A representative from the supplier of Robot 2 explains is as follows:

> *"Unfortunately, we do not have any information on how many times users use the system. This is more based on measuring how users interact on the platform, in terms of which features and sections the user uses."*

Users have since the first testing phase been active in the product lists. In the product list, users find prices and competitors for chosen products. The product list view is very similar in Robot 1 and Robot 2. All five users have the activity status active in all four periods of data collection. Data was collected during the first testing phase, the second testing phase, two months after go live and four months after go live. There is also a dashboard view that is new to users. In Robot 1, the reports displaying aggregated data was not trustworthy nor easy to understand. This is the part where managers would like end users to spend more time analyzing categories and brands. During the first part of testing 4 end users were medium active, while one was not active at all. However, in the second testing phase one of the end users was active while four were still only medium active. Going forward to after going live, four out of five end users were active in the dashboard view. This was the case both two and four months after the go live date. This is illustrated in Figure 4.

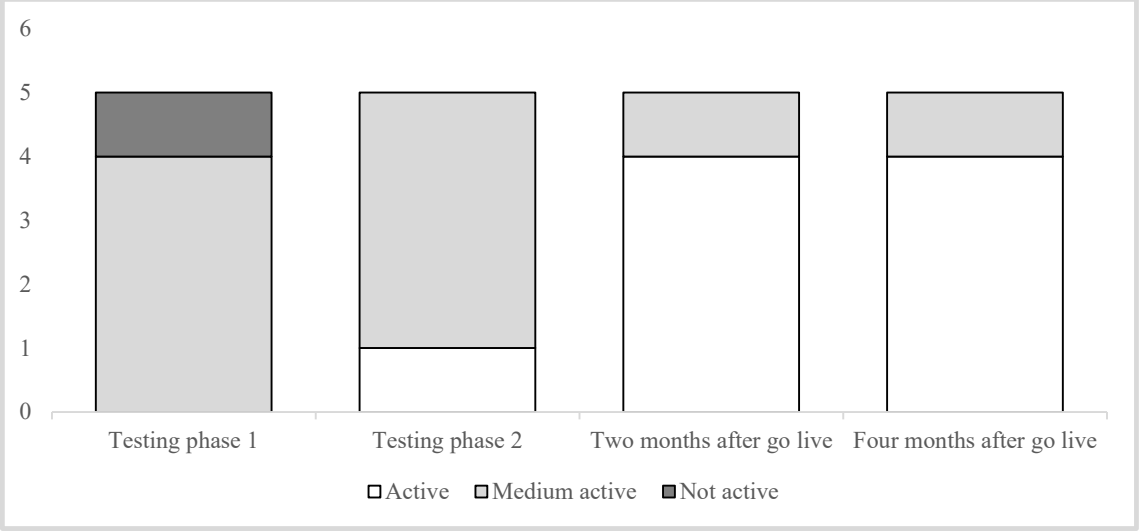


Figure 4. Users per activity status regarding dashboard usage in different time periods

There has been no extra push from management to force end users to use the dashboard, but it seems like end users have started to use the system more usage and adoption increase. This is in line with AAM that illustrates how actual system usage creates feedback loops to other important components, generating even more system use.

5.3.3 Summary of usage based on system logs

There were no clear shifts or trends from the change from Robot 1 to Robot 2. There has been a declining trend for products excluded from dynamic pricing for a longer period, that is assumed to be due to other factors than the change of dynamic pricing robot.

Based on actual system use in Robot 1 and Robot 2, we can conclude that most users were active in both systems in terms of using it. We can also conclude that the features in Robot 2 similar to those used in Robot 1 were used instantly. All users were active from the first period of testing. However, the new functionalities in the dashboard available only in Robot 2 did not have much usage at first. When users started to use the system more, more and more users were coded as active.

6 Discussion

Based on our case study of the implementation of a new dynamic pricing robot at an e-commerce company, this study has addressed the following research question: "What factors affect the acceptance and adoption of automation technology?" In this chapter, we discuss the key findings considering prior literature. The findings are structured around three themes: external variables- sufficient resources and communication, trust, and ownership.

6.1 Sufficient resources and communication

In this section, findings regarding the importance of sufficient resources and communication will be discussed. The first subsection focuses on the importance of sufficient resources and the second subsection focuses on the importance of communication.

6.1.1 Sufficient resources

Sufficient resources will be discussed both in terms of competence, time, and available support for category managers during the implementation process.

Sufficient resources and tools are crucial elements in supporting technology acceptance and adoption (Sethibe & Naidoo, 2022). If there is a lack of internal competence, the company needs to provide a solution for this. Otherwise, it can affect the acceptance and adoption of users (Gustafsson & Olmarker, 2021). Sufficient training and support seem to be lacking, particularly during the testing process. Category managers experienced being given tasks they did not have the time or competence to perform, while project management were frustrated by their inability to keep up. Sufficient training and support directly strengthen the trust and credibility of the technology (Theilsch et al., 2018; Venkatesh et al., 2003). Enabling the adoption of technology may require reconsidering current skills within the roles and matching them to the right tasks (Gustafsson & Olmarker, 2021). Ignoring this may undermine the perceived usefulness and purpose of the category managers' work and can lead to negative feelings toward the new technology (Bankins & Formosa, 2023).

Internal turbulence and uncertainty among the category managers affect other co-workers' and their actions and opinions by social influence (Venkatesh et al. 2003). Different external factors can both force and prevent desired behaviors. This does not depend on the individual's intention but rather the control, in this case category managers possess (Ajzen, 1991). In this context, external factors such as internal turbulence are preventing the desired behavior of category managers using Robot 2 to a larger extent. In a turbulent time, category managers want to be in control, and they experience more control by removing products from the dynamic pricing tool and setting manual prices. This could be due to the lack of satisfactory involvement or training from the employer, the employer must ensure that responsibilities in the pricing tool match the skills among the workers. Otherwise, job satisfaction and technical adoption might be compromised (Gustavsson & Olmarker, 2021).

Lower usage in time by category managers can be explained by the fact that they have not been using the system in other ways than before. The system is used for viewing product lists, competitors, and price points. When users now have a more user-friendly robot, they do not need as much time as in Robot 1 to complete the same tasks. According to the respondents', limited time was a reason for not increasing the use of the robot. Many of them also highlighted saving time as one of the main perks. It seems that the company has different views of the problem and that no clear picture of the result is communicated by managers. This continuously indicates the importance of ensuring users understand the new technology and its purpose (Asatiani, et al., 2019; Plattfaut, 2019). Since the adoption of technology is often needed to support end users' needs, technology acceptance needs to be addressed simultaneously as workforce issues (De Bernardini, 2016). Pricing is a central strategy in management (Christ, 2011) and becomes a business challenge because it is affected by cost and demand conditions (Laitinen, 2011). These conditions are not parallel which makes it complex to align with the strategic goals of the company (Laitinen, 2011).

6.1.2 Communication

All participants agreed that the new system was better than the previous one, but their view of how it should affect ways of working is very different. Category managers expect less usage because of more trust while the management expects more usage due to the same thing. This misalignment could be a result of flawed communication or a lack of understanding of the ways of working for category managers. As Plattfaut (2019) has stated, it is necessary for a company to make sure users understand the new RPA technology, its purpose, why it has been implemented, and the impact on users' future work through communication. Spreading knowledge about new automation and its integration is also supported by Asatiani et al. (2019).

Not enough planning could lead to decreased productivity, which may hinder the uptake of current technology (Siderska, 2020). In this case, it is proven that improved communication could be a successful part for the company to consider. The company needs to align and make sure that the different user groups have the same view of success. The category managers' current view of success is to spend less time on pricing tool, since trust is greater for the new dynamic pricing robot, while the project management and the general management aims for more time in pricing tool on analyzing data and get to know competitors more. Not all category managers felt any expectations on using the new tool at all, and they all use the tool in different ways. If general managers want to increase usage by category managers, they need to communicate this and present how it would help category managers save time in daily operations. According to Syed et al. (2020) it is highly important to be transparent regarding robots. When implementing RPA, it is critical to communicate the change, by communicating the purpose of the change and the anticipated changes for the workers which require leaders to be activated as change agents (Plattfaut, 2019). Communication does not only need to be encouraged by general management but also to be encouraged by the category managers. Most users are aware of the general management's expectations about the use is higher than the current use. Users are aware that the general management probably has expectations that are not fulfilled about current usage. Considering there is a risk that if category managers do not have the same desire as the general management, they might respond to undesired change by pretending to comply (Pachidi et al., 2021). It is important for the organization that general managers and project management must truly understand the category managers' challenges and how to improve their workflow, as described by Syed et al. (2020).

Not only was flawed communication detected for future ways of working and usage, but also for the interpreted business value. During interviews it became clear that category managers and general managers had different views of success, and if the implementation of Robot 2 was a success or not. Category managers were disappointed with the sales figures while general management was very pleased. As Clark et al. (2016) presents in their research, it is very common with overconfidence in the potential effects of new technology. It is important both for end users and for managers to be mindful when making decisions or plans based on believed future accomplices by new technology (Clark et al., 2016). As Leesakul et al. (2022) suggest understanding the wider human factors' challenges is important to better strategize technology adoption. It is necessary to target interventions both on an individual- and organizational level. In this case, the individual level is critical and has not been targeted, which is a possible explanation for the two different views of managers and users on success. External factors, such as sales performance, directly influence the perceived usefulness from a user perspective and thereby also the attitude toward

using and/or behavioral intention to use. Communicating progress could be a key element for the company to increase the perceived usefulness of the tool and thereby increase actual system use. Communicating progress and usefulness is extremely important since users in general will not adopt technology, they do not find useful (Venkatesh et al., 2003). Control and self-efficiency are important components of perceived usefulness (FakhrHosseini et al., 2022) and both are experienced to be higher in Robot 2 than in Robot 1.

There is a clear paradox in this case- improved trust removes the need for controlling from category managers. This leads to decreased usage because the estimated time in previous tasks is shorter when the data is trusted and not being double-checked. However, the time this frees from category managers should be allocated to new tasks (Puaschunder, 2020). The vision of the company was more analysis of the system, but this has been deprioritized in favor of other things. As stated previously by Siderska (2020) not enough planning could lead to decreased productivity which could be a reason why users may hinder the uptake of the technology (Siderska, 2020). However, automated technology is expected to support and not take over users' work (van der Aalst et al., 2018). Automation still relies on human involvement in the context of automation configuration, training, and procedure (Assatiani et al., 2019).

6.2 Trust alone does not affect acceptance and adoption of automation technology

The lack of trust, and the presence of mistrust, was highlighted as a major issue for the company during early discussions. Trust was shown to be significantly higher in surveys and this was also confirmed in all the interviews. However, this had no impact on the behavioral intention to use. In fact, the behavioral intention to use decreased even if all other parameters were higher than before. Trust seems to not be the major issue in terms of system usage, but rather something that can decrease usage when it comes to automation technology. Trust alone, is an important foundation for building acceptance and adoption. There are a lot of other factors than trust that are important. Trust cannot alone drive acceptance and adoption, as supported by Chen et al., (2021). Trust is not sufficient alone, environmental culture and regulations are further potential influential factors (Chen et al., 2021).

Fear is a contrast to trust, and fear based on previous experiences can prevent the adoption of new technology. Fear is identified as one of the most prominent challenges with technology adoption. Fear can be both regarding job displacement and changing working habits (Seiffer et al., 2021). Negative factors like fear can result

in resistance of technology adoption (Leesakul et al., 2022; Syed et al., 2020; Sieffer et al., 2021). In this case, the fear of changing working habits and spending more time in the dynamic pricing robot could cause some resistance among the category managers to adopt the new functionalities available. There is also a fear based on current sales performance that Robot 2, or the set price strategies, is not working good enough. As a response to this, many category managers remove products from dynamic pricing to set manual prices they are in control of. Fear of losing control is a triggering factor that can cause user resistance to adoption (Lapointe & Rivard, 2005; Ajzen, 1991; Venkatesh et al, 2003.; FakhrHosseini et al, 2022).

6.3 The role of psychological ownership

One main factor identified during interviews with category managers was the lack of ownership of the dynamic pricing robot, and a lack of desire for ownership. Ownership is currently not displayed as a key dimension of the AAM model, but our study indicates that it influences usage and adoption of automation technology. By further investigating the role of ownership, we discovered previous research about psychological ownership (PO) which captures what we have observed in our study. In brief, PO describes individuals' behaviors when they feel that they possess an ownership stake. The ownership stake concerns a target and not physical objects (Campbell Pickford et al., 2016).

Organizations can enable PO by allowing employees to work creatively, learn about it, and contribute to decisions (Campbell Pickford et al., 2016). When evaluating the AAM, all constructs are connected and to some extent fulfilled, but the desired adoption and actual system usage are not achieved. We believe this is partly due to the lack of PO among the category managers. Category managers clearly expressed during multiple interviews that they do not today feel any ownership of the new pricing tool and did not during the implementation process. The category managers were included in the decision about changing the pricing tool, but not as much during the implementation process, and had no desire to be further involved. Only one of the category managers was represented in the project management team. The desired state expressed during interviews would be to have the system delivered as a product with experts working with the strategies. It is important for the management team to address and make sure that the right resources and skills are available. Otherwise, this can affect acceptance and adoption negatively (Leesakul et al., 2022; Syed et al., 2020; Sieffer et al., 2021). The lack of PO is clearly visible when analyzing the actions made by category managers to resolve the decreasing sales. Instead of focusing on how to change or optimize strategies in the dynamic pricing robot, category managers remove products and set manual prices where they feel like they are in control.

The lack of PO can be the reason for not being invited enough to decisions and processes. PO can be influenced by external variables such as ability to work creatively and being invited to contribute to decisions (Campbell Pickford et al., 2016). By experiencing PO of the robot, users would have a personal stake in the performance of the tool- influencing the behavioral intention to use. Our research suggests that the lack of PO among the category managers affects their behavioral intention to use. This in turn could be one of the explaining reasons why expected adoption and usage are not achieved.

6.4 Implications: Psychological Ownership (PO), a new dimension of AAM

With this backdrop, our study suggests that the AAM model should also include the construct of PO. The addition of PO arises from the category managers' expressed lack of ownership and the desire for someone else to work with the dynamic pricing robot. All other constructs of the AAM are relevant and are to some extent achieved, but the company still has not achieved the desired state of acceptance and adoption. The category managers trust the system, the perceived usefulness was very strong, and the attitude towards using it as well. Though, there is another factor affecting the behavioral intention to use directly, that we would like to suggest could be PO. Our study also shows that external variables such as communication and available time directly influence the behavioral intention to use, without passing perceived usefulness or perceived ease of use. We would also like to suggest that there are feedback mechanisms from actual system use towards attitude toward using and external variables. For example, by using the system dashboard the category managers discovered new insights directly impacting the attitude toward using. The actual system uses also affected external variables such as available time. The reason for decreased system use was lack of time which led to the formal manager setting multiple days aside for testing and removing all regular tasks. This was a crucial part of making the plan to go live. All these parameters affect the actual system use- creating a reinforcing cycle (Ghazizadeh et al., 2012).

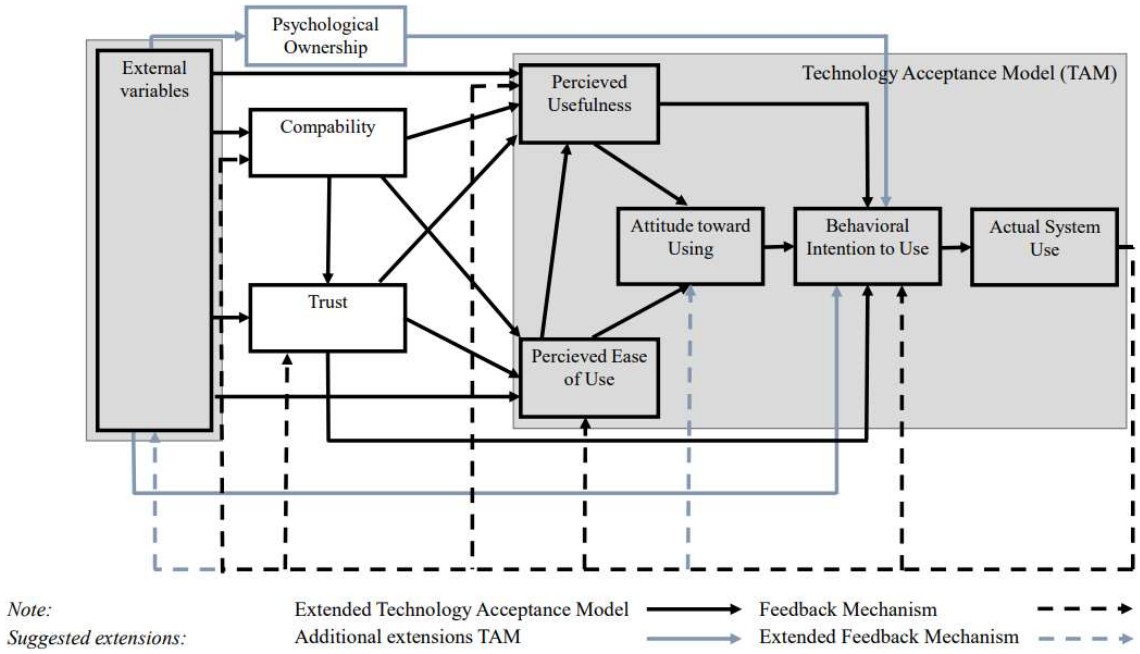


Figure 5. Suggestion of extensions of AAM

That said the findings of this study provide insights regarding the complexity of technology acceptance and adoption; it requires strong and clear communication, trust and a sense of ownership among the users.

7 Conclusion

In this thesis, we set out to study the challenges of user acceptance and adoption during the implementation of automation technology. The aim was to answer the research question; What factors affect the acceptance and adoption of automation technology? TAM was chosen as our initial framework considering it is well-established and has been around for decades (Davis, 1989). However, automation technology has evolved tremendously since TAM was developed. TAM does not encompass automation, whereas the AAM model specifically addresses this gap (Ghazizadeh et al., 2012). It is worth noting that AAM has not been studied to the same extent as TAM. Our main conclusions from this study regarding factors influencing the acceptance and adoption of automation technology are as follows: 1) First, the external variables of sufficient resources and communication were important for adoption. The implementation took place during a turbulent and busy period, which limited end-users' resources and engagement. There was also a lack of communication from the management both before and after the implementation. The lack of clear expectations and communication of results from management may have affected the users' intentions of the system and thereby the actual usage. 2) Second, our study showed that trust solely did not impact perceived ease of use nor perceived usefulness as AAM suggests. This is supported by Clark et al. (2016). Even though complementary components were important for describing the full picture, trust and mistrust emerged as significant components. The need for control made category managers choose manual solutions, decreasing technology use in terms of number of active articles. 3) Third, our study found PO (Campbell Pickford et al., 2016) as an important dimension in understanding how individuals adopt and use technology. We suggest an extension of the current AAM model with PO, influenced by external factors and directly influencing behavioural intention to use. By applying the AAM model as a guiding framework our thesis has contributed to new knowledge within the field of automation technology and user adoption. The framework proposed in our thesis will help companies to be mindful of their implementation of automated technology and enhance user acceptance and adoption. This new understanding provides a more holistic approach for managers by targeting the individual level.

Lastly, to better understand the implications of these results, future studies could address challenges of automation technology acceptance and adoption in various research areas by applying our proposed extended version of AAM including psychological ownership. It would be interesting to see similar studies carried out within other companies using pricing automated technologies in the field of e-commerce.

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9 Appendices

9.1 Appendix 1: Survey

Template for survey conducted by category managers. The survey was made before going live with new tool (regarding previous system) and after going live with the new tool (regarding new system).

Percieved Usefulness (PU)		Strongly disagree	Disa-gree	Neutral	Agree	Strongly agree
PU 1	Using the system helps me to increase efficiency in my daily work	o	o	o	o	o
PU 2	By using the system I get more time for other tasks	o	o	o	o	o
PU 3	By using the system I feel confident that my products always have the right price	o	o	o	o	o
PU 4	By using the system I get valuable insights about competitors and my price position	o	o	o	o	o
PU 5	By having a pricing engine, I follow changes in market and season	o	o	o	o	o

Percieved Ease of Use (PEU)		Strongly disagree	Disa-gree	Neutral	Agree	Strongly agree
PEU 1	I know how to manually change prices in an efficient way	o	o	o	o	o
PEU 2	I know how to export relevant data in excel format	o	o	o	o	o
PEU 3	I find the system flexible to work with	o	o	o	o	o
PEU 4	I would easily find information I am looking for using the system	o	o	o	o	o

PEU 5	I can easily get support for percieved errors	o	o	o	o	o
PEU 6	I can easily get support for tasks I am not sure on how to perform	o	o	o	o	o
PEU 7	I understand why prices change and the underlaying logic and strategy	o	o	o	o	o

Attitude Toward Using (ATU)		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
ATU 1	I use the pricing engine in my daily work to find competitor prices	o	o	o	o	o
ATU 2		o	o	o	o	o
ATU 3	find prices for my products from all selected competitors	o	o	o	o	o
ATU 4	only change pricepoints that should be changed	o	o	o	o	o
PIC 5		o	o	o	o	o

Behavioral Intention to Use (BIU)		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
BIU 1	provide me with correct price information from competitor data	o	o	o	o	o
BIU 2	perform all pricing changes made manually or by an automatic strategy within 24 hours	o	o	o	o	o
	find prices for my products from all selected competitors	o	o	o	o	o
	only change pricepoints that should be changed	o	o	o	o	o
		o	o	o	o	o

Trust (TU) I trust the system to…	Strongly disagree	Disagree	Neutral	Agree	Strongly agree

TU 1	provide me with correct price information from competitor data	o	o	o	o	o
TU 2	perform all pricing changes made manually or by an automatic strategy within 24 hours	o	o	o	o	o
TU 3	find prices for my products from all selected competitors	o	o	o	o	o
TU 4	only change pricepoints that should be changed	o	o	o	o	o

9.2 Appendix 2: Tables with codings for answers and user groups

Weighted answers survey

Scores used for summarizing and comparing survey answers.

Score	Answer
1	Strongly disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

Defined user groups

Definition of user groups presented in results and discussion section.

User group	Participants
Category managers	All category managers
Project management	Head of pricing and analytics, Head of IT
General management	Company management team (CEO, CPO, CMO, CFO, Head of IT)

9.3 Appendix 3: Interview Guide

Interview guide for semi structured interviews with category managers, head of IT and head of pricing and analytics(project manager). All interviews were conducted in Swedish since this was all interview subjects' native language.

Interview Guide- Translated to English

1. Control and information before interview start
    1.1. Check with the participator if we can record interview. Recording will only be used for transcribing, and then deleted.
    1.2. Inform about anonymity. Codes will be used for all participants; category managers will be anonymous while other roles where there is just one will be named by formal title.

2. Introduction
    2.1. Who are we?
    2.2. Short information about the study

3. Background and role
    3.1. What is your educational background?
    3.2. When were you employed at the company?
    3.3. What are your most favorite parts vs. least favorite parts of your current role?

4. Robot 1
    4.1. What is your general opinion about Robot 1?
    4.2. What functions do you mainly use?
    4.3. How much time do/did you spend in the system weekly?
    4.4. Did you miss any important features in Robot 1?
    4.5. Did you trust the system to find all relevant competitors and deliver correct pricepoints based on set strategies? Explain.
    4.6. Did you fully understand the pricing strategies, and why pricepoints where set? Explain.

5. Robot 2
    5.1. What is your general opinion about Robot 2?
    5.2. What functions do you mainly use?
    5.3. How much time do you spend in the system weekly?
    5.4. Do you miss any important features in Robot 2?

5.5. Do you trust the system to find all relevant competitors and deliver correct price-points based on set strategies? Explain.
5.6. Do you fully understand the price strategies and why pricepoints are set? Explain.

6. General pricing strategy
   6.1. Do you know what the current pricing strategy is at the company?
   6.2. Would you like to be more or less involved in the current pricing strategy?

7. Management
   7.1. Do you have a clear understanding of what is expected of you when it comes to use and performance in pricing? Explain.
   7.2. Do you feel like pricing is prioritized from management? Explain.
   7.3. What are your most prioritized tasks?
   7.4. Do you feel involved in the process of change? Explain.

8. Wishes for the future – new or recurring issues?
   8.1. What do you feel is missing in the system? Explain. Has this been the case also in previous pricing tool?
   8.2. What can be done differently to become better? Explain. Has this been the case also in previous pricing tool?
   8.3. What is not functioning well? Explain. Has this been the case also in previous pricing tool?
   8.4. How can that be changed?
   8.5. What would you like to spend more time respectively less time doing?
   8.6. What problems does automation bring?
   8.7. What do you think it adds?

Interview Guide- Original version in native language

1. Kontroll och information innan intervjun startar
   1.1. Undersök med respondenten om vi kan spela in intervjun. Intervjun kommer att användas för transkribering, och därefter raderas.
   1.2. Informera om anonymitet. Koder kommer att användas för alla deltagare. Kategoricheferna kommer vara anonyma medan övriga roller kommer benämnas med formell titel.

2. Introduktion
   2.1. Vilka är vi?
   2.2. Kort information om studien

3. Bakgrund och roll
   3.1. Vad är din utbildningsbakgrund?
   3.2. När anställdes du på företaget?
   3.3. Vilka delar av din nuvarande roll är roligast vs minst roliga?

4. Robot 1
   4.1. Vad är din generella åsikt om robot 1?
   4.2. Vilka funktioner använder du primärt?
   4.3. Hur mycket tid spenderar du i systemet veckovis?
   4.4. Saknar du några viktiga funktioner i Robot 1?
   4.5. Litar du på att systemet hittar alla relevanta konkurrenter och ger korrekta prispunkter? Förklara!
   4.6. Förstår du fullt ut prisstrategierna och varför prispunkterna sätts? Förklara!

5. Robot 2
   5.1. Vad är din generella åsikt om robot 2?
   5.2. Vilka funktioner använder du primärt?
   5.3. Hur mycket tid spenderar du i systemet veckovis?
   5.4. Saknar du några viktiga funktioner i Robot 2?
   5.5. Litar du på att systemet hittar alla relevanta konkurrenter och ger korrekta prispunkter? Förklara!
   5.6. Förstår du fullt ut prisstrategierna och varför prispunkterna sätts? Förklara!

6. Generell prisstrategi
   6.1. Vet du vad den nuvarande prisstrategin är på företaget?
   6.2. Skulle du vilja vara mer eller mindre involverad i den nuvarande prisstrategin?

7. Management
   7.1. Har du en tydlig bild av vad som förväntas av dig när det kommer till användande och performance av prisverktyget? Förklara!
   7.2. Känner du att prissättning är prioriterat från management? Förklara!
   7.3. Vilka är dina högst prioriterade arbetsuppgifter?
   7.4. Känner du dig involverad i förändringsprocessen? Förklara!

8. Önskemål för framtiden- nya eller återkommande problem!
   8.1. Vad känner du saknas i det nya prisverktyget? Förklara! Har det även varit så I föregående robot?
   8.2. Vad kan göras annorlunda för att bli bättre? Förklara! Har detta också varit läget I föregående robot?

8.3. Vad fungerar bra? Förklara! Vad fungerar mindre bra? Förklara! Har det varit så-här även I föregående robot!
8.4. Hur kan detta förändras?
8.5. Vad skulle du vilja spendera mer vs mindre tid på?
8.6. Vilka problem medför automation?
8.7. Vad tillför automation?