Master thesis

Understanding Loyalty in B2B E-commerce SaaS Relationships via the Influence of Satisfaction and Trust Empirical insights from 33 SaaS-using firms.

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Abstract

Goal: In the increasingly competitive landscape of e-commerce software, customers are faced with a multitude of choices. With the risk of customer loss looming, SaaS providers, such as FactFinder, face the critical task of understanding the dynamics of their business-to-business (B2B) relationships with customers and how to maintain them effectively. Loyalty demands much from organizations and especially in fast-changing environments like the SaaS industry. Therefore, this research seeks to formulate and validate a framework aimed at identifying the determinants B2B e-commerce relationships. This research focuses on the factors that influence customer satisfaction and trust, which together generate and reinforce loyalty.

Method: The systematic literature review identified five key factors: service quality, perceived usefulness, perceived ease of use, perceived value and perceived risk. To assess the influence of these factors, a survey among 295 randomly assigned FactFinder customers was conducted, where 43 participants, representing 33 different companies, responded. A PLS structural equation model was then used using statistical software. In addition, four validating interviews were conducted for further validation and in-depth customer insights.

Results: The results have shown that the model was validated and usable for analysis. Consequently, it was found that customer satisfaction and trust in FactFinder's current services are particularly high. Importantly, the findings indicate that satisfaction plays a slightly larger role in driving loyalty than trust. The direct influences on satisfaction are primarily attributable to service quality and perceived ease of use. In contrast, trust is mainly influenced by service quality, perceived value, and perceived usefulness. Furthermore, perceived risk was not identified directly affecting trust and satisfaction. The validation interviews have emphasized the critical role of factors such as reliability, competence, and alignment in customer satisfaction within the SaaS context.

Conclusion: In B2B settings, our study concludes that customer satisfaction is mainly influenced by the software's functional features, prioritizing ease of use and responsive service quality where trust, is fostered by the software's economic value, achieved through the SaaS vendor's consistent service delivery and results, while considering the customer's business objectives. The framework proposed in this study provides FactFinder with a comprehensive understanding of the dynamic interaction between trust, satisfaction, and customer loyalty. It serves as a customized guide, highlighting the critical factors that need attention to foster sustainable customer loyalty.

Implications:
Current research on Software as a Service (SaaS) providers within the E-commerce industry, particularly in the Business-to-Business (B2B) context, remains relatively limited. This study serves as an effort in this direction and contributes significantly to the creation of a validated model that provides valuable insights for SaaS providers and clarifies the critical role of trust and satisfaction in building and maintaining customer loyalty. The findings highlight the importance of economic value in establishing trust, while highlighting the role of functional aspects in fostering customer satisfaction. This research enables a better understanding of the complex dynamics underlying customer relationships in the SaaS industry.

Keywords: software-as-a-service, customer satisfaction, trust, customer loyalty, continuance intention, business-to-business, SaaS provider, E-commerce.

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Introduction

Meeting and exceeding customer needs and expectations, while delivering an outstanding satisfaction experience in various market sectors, has become an essential requirement for companies around the world (Abu-Salim et al., 2017). ''Satisfaction plays a key role in avoiding a client's switch to a new vendor and increasing its positive word of mouth and long-term continuation of relationships with the service provider'' (Chou & Chiang, 2013). The concept of customer satisfaction has gained significant research attention in recent years, as businesses strive to meet the challenges of a competitive marketplace. Given the intense competition in the industry, it is widely recognized that understanding and fulfilling customer needs is critical to success, as customers are increasingly aware of their value to SaaS companies and play a crucial role in determining the success of the business (Baumann et al., 2022). In this highly competitive business environment, the E-commerce SaaS organizations that can attract a substantial customer base and maintain an exceptional level of customer loyalty will position themselves as a frontrunner in the market. Therefore, it is vital to have a deep understanding of customer's needs, their perception of the company, and their expectations to effectively maximize customer retention (Bhattacherjee, 2001).

Research has highlighted the crucial role of meeting customer needs and adapting to evolving preferences for the long-term success of an organization (Baumann et al., 2022). However, simply satisfying customers may not always guarantee their loyalty. Recent evidence suggests that customers may choose to switch their business to other providers even when they are fully satisfied (Kesuma et al., 2021). There are various factors that can contribute to customers switching to alternative firms, such as enhanced features and functionality, the introduction of new technologies in the industry, integration capabilities, cost-effectiveness, customization and personalization, and data security and compliance.

Understanding and fostering customer loyalty, as reflected in their continuance intention, is of utmost priority in today's competitive business landscape, as it drives repeat business, positive word-of-mouth recommendations, and sustainable relationships with customers (Seong Tak & Park, 2018). Studies have shown that there is a positive relationship between customer satisfaction and loyalty in the SaaS sector (Alsajjan, 2014; Eid, 2011; Mishra et al., 2023). These studies have shown that customer satisfaction is a leading factor in determining loyalty. In other words, the degree to which customers are satisfied with their SaaS experience plays a central role in their loyalty to the provider. However, there are also studies that suggest trust is more important than satisfaction in ensuring loyalty (Caceres & Paparoidamis, n.d.; Ozdemir & Sonmezay, 2020.).

Duncan & Elliott (2002) study revealed a strong connection between customer loyalty and organizational profitability, suggesting that businesses with loyal customers enjoy a significant competitive advantage. As a result, gathering feedback from customers about their satisfaction, trust, and loyalty is highly beneficial for SaaS providers when they want to enhance their products, services, and plans to keep customers coming back. In addition, those same studies are useful to gain a competitive advantage and reduce the risk of customers switching or defecting. While some SaaS providers delegate customer satisfaction assessments to survey companies, and others conduct customer satisfaction surveys internally, the focus on studying the levels of trust and loyalty among their customers is often overlooked. While previous research has indicated that there is a significant dissatisfaction rate among customers of SaaS, and the factors that contribute to customer satisfaction and trust are not clear, which is hindering the progress of SaaS (Benlian et al., 2014). This study highlights the importance of fostering customer satisfaction, loyalty and trust in the e-commerce industry, as it can lead to increased revenue and sustained growth over time. Many studies focusing on SaaS usage and adoption have already been conducted (Cho & Chan, 2015; Heart, 2010). However, these studies mainly focus either on only the

satisfaction, the adoption of the software or SaaS in general. Less research has been done on the factors affecting satisfaction and trust which results in loyalty in specific industries such as B2B e-commerce. Therefore, this research focuses specifically on SaaS companies providing software for e-commerce given several reasons and valuable insights. First, the growing e-commerce industry demands specialized software solutions tailored to its unique needs. Second, the increasing adoption of SaaS in e-commerce highlights the relevance of studying this specific area. Third, e-commerce companies face specific challenges that require targeted SaaS solutions, such as online transactions, conversion rate optimization, and customer journey experiences. Finally, using the right SaaS software can give e-commerce companies a competitive advantage thanks to advanced features, automation capabilities and improved customer experience in this dynamic industry. Therefore, understanding the factors that influence satisfaction, trust, and loyalty in B2B e-commerce relationships is crucial for businesses to build successful and sustainable partnerships with other organizations. Therefore, the following research question has been formulated to support the overall aim of this study: *''How can e-commerce SaaS companies effectively measure loyalty in B2B relationships via trust and satisfaction?''.*

This study aims to contribute to addressing the gap in the literature by examining the factors that influence satisfaction and trust which results in loyalty in B2B e-commerce relationships. Specifically, it seeks to identify the key factors that influence satisfaction, trust and loyalty in B2B e-commerce relationships, as well as to explore the interrelationship between those factors. Additionally, this study aims to add to the existing body of literature on SaaS for E-commerce and B2B e-commerce, which has been less explored compared to SaaS in general and B2C e-commerce. To achieve the research objective, this study will use a survey as the primary research methodology which later is analyzed using statistical techniques in Smart PLS-4 and SPSS. The article will continue with the theoretical background and research hypotheses, which will serve as the basis for the research model and the connections between the variables. After that, the methodology will be discussed. Then the survey results and validation interviews will be presented after which the discussion and conclusion are written.

1.1 Background

FactFinder e-commerce software has experienced significant growth, served more than 300 companies, and powered more than 1800 web shops, mainly concentrated in the Nordic countries, DACH region and the UK. In addition to expanding its customer base, FactFinder places a strong emphasis on customer retention, aiming to foster lasting relationships and customer loyalty. The European market offers significant growth prospects, mainly due to its scale. With the e-commerce industry reaching €84.5 billion in Germany alone by 2022 (Statista, 2023), the broader European market is expected to grow to €632 billion by 2023 and an impressive €902 billion by 2027 (Statista, 2022). However, attracting new customers requires both time and financial investment. Therefore, it is of utmost importance to thoroughly understand customers' feelings about the software, service quality, and FactFinder as a whole. By addressing areas for improvement based on customer feedback, FactFinder can increase its competitive advantage and increase its chances of being preferred by potential customers.

FactFinder places great emphasis on improving its services, with a primary focus on product development. Although adding new features and improving existing ones can make both new and current customers more satisfied, it doesn't automatically guarantee increased customer loyalty. FactFinder recognizes the importance of customer satisfaction and has adjusted its business operations accordingly. This involves hiring consultants, setting up service level agreements, and employing data analysts to thoroughly examine a comprehensive dataset, including sales data, factual details, root causes, and their outcomes.

Currently, FactFinder has no clearly defined measurement tool and no specific time frame for evaluating customer satisfaction. Therefore, FactFinder wants to understand the key factors that influence customer satisfaction and trust. By assessing these factors, FactFinder aims to measure the level of customer satisfaction and trust, identify areas in need of improvement and, ultimately, increase customer satisfaction and foster stronger relationships. This strategic approach aims to reduce customer churn, resulting in fewer subscribers canceling their subscriptions and ensuring the continuity of valued paying customers.

1.3 Description of the company

Fact-Finder, founded in Pforzheim, Germany, was founded in 2001 by the founders who are no longer employed within the organization. The core business is creating software for webshops that can be used for optimizing customer journeys and increasing online sales (conversion). With a total of 200 employees spread over 5 different countries (Germany, England, the Netherlands, Sweden and Italy), Fact-Finder is an internationally operating organization. FactFinder serves both business-to-business and business-to-consumer webshops with its software. The strength of the software lies in the balance between human and artificial intelligence, which results in solutions for product discovery, personalization, and merchandising for web shops. Although the AI for online product discovery plays an important role, users of the software have the ability to regulate this themselves in the user-friendly back-end. This makes Fact-Finder a solution within E-commerce that can be completely tailored to business objectives.

FactFinder maintains strong relationships with its customers. For this, it employs consultants, among others, who maintain both technical and social relationships. However, FactFinder is no exception of an organization where customers do not leave (customer churn). Although the last year the figures of churn have decreased. Nevertheless, from a preventive point of view, FactFinder would like to investigate what characterizes a good relationship within a B2B SaaS environment. In addition, it is of interest to FactFinder because of the rapidly changing market conditions, it can see customer retention as a competitive advantage but above all for improving business performance. Although the unrelated variables all have an impact on trust and satisfaction, the interrelationships are important for the new insights gained from this study.

2.0 Theoretical framework

In preparing the literature review, a systematic and carful approach was used to identify and select relevant sources and articles. To guide this process, the research utilized the five-stage grounded theory model developed by Wolfswinkel et al. (2013) which can be found in Appendix A. The literature review in this chapter comprehensively addresses relevant topics in an organized manner, Setting the stage for creating a survey to measure trust, satisfaction, and loyalty in B2B relationships.

2.0.1 SaaS Lifecycle Management models

SaaS lifecycle management refers to the systematic approach and strategies employed by organizations to effectively manage the various stages of adopting and maintaining Software-as-a-Service (SaaS) solutions. It encompasses the entire lifespan of the SaaS application, from the initial evaluation and adoption to ongoing usage, renewal, and potential retirement. Several models have been developed for the adoption and retention of SaaS solutions. in 2022 Rahman researched the factors that most influenced a company's adoption of a new SaaS. In addition to finding 25 factors, the Technology Acceptance Model (TAM) emerged as the most used model in studies focusing on the adoption of SaaS (Rahman, 2022). Although this model focus mainly on the acceptance of IS, more recently, scholars have begun to also study the nature of IS continuance. Bhattacherjee (2001) developed the SaaS continuance model which is closely related to the TAM model. IS continuance behavior referring to a stage where the use of information systems goes beyond conscious effort and becomes integrated into regular and habitual activities which is a component of loyalty as it reflects the intention to remain engaged (Bhattacherjee, 2001). In addition, the SaaS-Qual model also emerged frequently in studies of SaaS lifecycle management since service quality is an important determinant of satisfaction. The SaaS-Qual model is based on Parasuraman's SERVQUAL model which initially was developed for measuring service quality and consists of five dimensions: assurance, empathy, reliability, responsiveness, and tangibles. Benlian et al. (2014) challenged the suitability of the existing model for assessing service quality in a SaaS context. Consequently, he developed a unique model, SaaS-Qual, consisting of 42 items across six dimensions: rapport, responsiveness, reliability, flexibility, features, and security (Benlian et al., 2014).

For this research two important models serve as a foundation. First the Satisfaction-trust Model (STM) of Alsajjan (2014) which shows a clear triangulation of the relationship between satisfaction, trust and loyalty with service quality as the determinant of satisfaction and trust (see figure 2). Second the widely used SaaS-Qual model of Benlian et al. (2014) is used to measure the quality of service which is also an important part of the STM model. Although the STM model has not yet been tested within a SaaS study, it has been used within various service industries, making it useful for this study. This makes them the most appropriate models for this study. The technology acceptance model (TAM) is not used as a dominant model but rather for support in identifying the independent variables that influence behavioral intentions such as satisfaction and trust. Although the TAM model is mostly used in technology adoption, it also proves to be very useful in technology continuity (Rahman, 2022).

2.1 Theoretical analysis and hypothesis development

The analysis of theory based on the systematic literature review involves applying theories of SaaS quality and B2B relationships to the context of SaaS-using organizations in E-commerce. A comprehensive overview of relevant studies and their constructs is presented in Table 1. Service quality is consistently mentioned in most studies, often measured in connection with customer trust and satisfaction. Loyalty, referred to as usage continuance in many studies, is a focal point in one study and measured in four others. Perceived usefulness, perceived ease of use and perceived risk are measured in multiple models. Perceived value, while less frequently studied, emerge as an important factor in practice and is relevant due to highly competitive markets.

Publication	Chen and Dhillon, 2003	Tam, 2004	Heart, 2010	Boksberger and Melsen, 2011.	Davis, 1989	Eid, 2011	Chou and Chiang, 2013	Bhattacherjee A, 2001	Benlian, Koufaris and Hess, 2014	Cho and Chan, 2015	Freitas and Neto, 2017	Chou, 2019	Liu and Prybutok, 2021	A. Mishra et al., 2023	# used
Model	Model on measuring dimension trust	Integrative model on service quality and perceived value	SaaS trust and risk related factors	Review on perceived value	TAM model	Model on customer e-commerce satisfaction	Saas-Model	An expection confirmation model on IS continuance	SAAS-Qual	Integrative framework for SaaS adoption	Alternative to SERVQUAL	SaaS-CRM	Integrated SOR and IT continuance model	Post-acceptance model of IT-continuance	
Service Qaulity	X	X		X		X	X		X	X	X	X	X	X	11
Satisfaction	X	X				X	X	X	X		X	X	X	X	9
Loyalty		X				X	X	X	X			X	X	X	8
Trust	X		X	X		X	X					X		X	7
Perceived value		X		X		X		X					X		5
Perceived Ease of use					X	X		X	X					X	5
Perceived usefullness					X			X	X			X		X	5
Perceived risk			X			X		X				X			4

Table 1: Most important concepts from literature based on SLR.

2.1.1 Loyalty

In the marketing literature, a conceptual definition has emerged by Jacoby & Chestnut in 1978, they outline that loyalty consists of (1) a systematic and biased preference for a specific brand or group of brands, indicating a consistent choice that is not random. (2) This loyalty is expressed over time, which requires a stable buying pattern over a period of time. (3) Brand loyalty can be observed at the level of a decision unit, which can be an individual, household, or organization. (4) It results from the selection of one or more brands from a set of options, which can lead to loyalty to a group of brands. (5) Brand loyalty is the result of psychological processes involving decision-making, evaluation, and an emotional bond (Chestnut & Jacoby et al., 1978).

This definition is also used by Mellens et al. (1996), who uses his research to distinguish clear categories to make loyalty more measurable. Four categories are distinguished. In the discussion of operationalizing brand loyalty, the criteria identified by Chestnut & Jacoby et al. (1978) in the conceptual definition serve as a framework for evaluating specific measurement methods. Brand loyalty measures can be categorized into two main dimensions. The first dimension distinguishes between Attitudinal and Behavioral Measures. Attitudinal measurements focus on cognitive reactions and emotional attachment, while behavioral measurements look at actual purchasing behavior over time. The second dimension distinguishes between brand-focused measurements, which evaluate loyalty for specific brands, and individual-focused measurements, which evaluate loyalty for individual consumers, with less emphasis on a particular brand. These dimensions help define and classify different approaches to measuring brand loyalty, each with its unique strengths and weaknesses.

Researchers like Rauyruen & Miller (2007) advocate a comprehensive approach to customer loyalty that includes both behavioral and attitudinal loyalty. Accordingly, this study addresses both dimensions. Attitudinal loyalty depends primarily on factors such as satisfaction and trust, while behavioral loyalty is determined by the willingness of typical business customers to buy services and products from the service provider again, thereby maintaining a long-term relationship with the service provider (Rauyruen & Miller, 2007)).

In later research by Al-Haraizah & Al-Nady (2015), studied various theoretical perspectives (including the above) on the effect of E-loyalty on the success of B2B e-commerce and found a positive relationship here. Here, E-loyalty is defined as the extent of customer or user loyalty towards online platforms, brands, products, services, or stores in the digital realm. It involves customers' commitment and attachment to online businesses, commonly measured through their actions, attitudes, or both. (Al-Haraizah & Al-Nady, 2015).

E-commerce SaaS Loyalty

This research defines B2B customer loyalty as a strong commitment to continuously use a preferred product or service, resulting in repeat purchases despite potential marketing efforts and situational factors that may cause switching which is also known as continued usage (Benlian et al., 2010). Within the context of this research, the terms 'loyalty' and 'continuance intention' are used interchangeably. Loyalty, in terms of customer behavior, indicates the degree to which customers demonstrate a dedicated commitment and strong bond with a specific brand or company. This commitment is often reflected in repeated purchases, positive word-of-mouth, and hesitation to switch providers. (Eid, 2011). Continuance intention, on the other hand, represents the intention of customers to continue using a product or service. It is influenced by factors such as perceived value, satisfaction, and the costs associated with switching (Baumann et al., 2022). Continuance intention is a combination of attitudinal and behavioral loyalty. It represents continued use based on both the customer's positive attitudes (attitudinal loyalty) and their willingness to continue using the product or service (behavioral loyalty) (Baumann et al., 2022). According to Eid (2011) and Kesuma et al. (2021) loyalty is determined by the level of satisfaction, whereas Chen and Dhillon (2003) argue that trust holds greater importance than satisfaction in fostering loyalty. Within this study, both constructs are measured since Crosby et al. (1990) found that the relationship quality is determined by a business who has significant trust in a provider and is consistently satisfied about past performance. Rauyruen & Miller (2007) found both a positive effect of trust and satisfaction in a B2B perspective.

Additionally, in 2014, Alsajjan (2014) developed the Satisfaction-Trust Model (STM) which was tested in the mobile service industry. The model shows a clear triangulation of the relationship between satisfaction, trust, and loyalty. Although the model has not been widely used, Alsjjan's results are widely used as a foundation for confirming the results of other studies (Kesuma et al., 2021). In the context of the STM, loyalty can be predicted by trust and satisfaction, while service quality influences both constructs. Moreover, trust plays a crucial role in determining satisfaction (Alsajjan, 2014). According to a study by Eid (2011), the interaction between trust and satisfaction has a significant impact on customer retention. Moreover, their study found that satisfaction has a greater influence than trust. Subsequently, some studies have adopted the model in a modified form adding additional variables as in the study by Pumim et al. (2017), who found that perceived value is an additional important determinant for measuring satisfaction and trust. Therefore, the model is applicable for this research where we identified more factors that could influence trust and satisfaction.
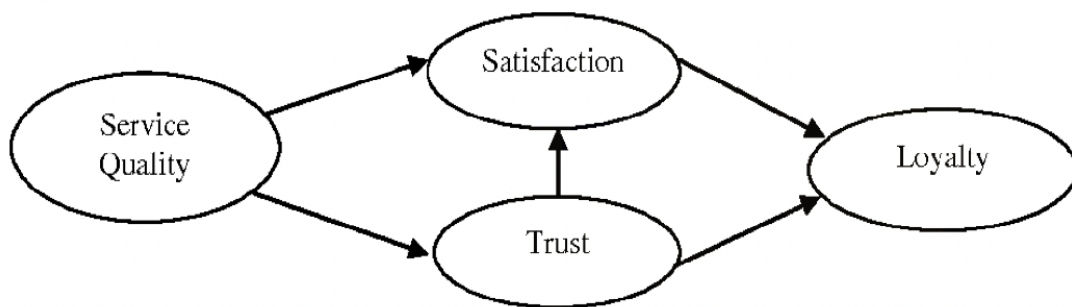
Figure 1: STM model of Alsajjan (2014)

2.2 Determinants of loyalty

Since trust and satisfaction are known to determine a good relationship (Crosby et al., 1990) (Rauyruen & Miller, 2007), which is conceptualized as loyalty, both constructs are now explained.

2.2.1 Ecommerce SaaS trust

Trust plays a fundamental role in our daily lives and is a crucial element in society. Customer trust can be characterized as a collection of beliefs held by consumers regarding specific attributes of the provider, as well as expectations about the provider's future behavior (Crosby et al., 1990). SaaS trust can be defined as the confidence individuals and organizations have in the desired outcomes and reliable behavior of SaaS providers. It is a crucial factor in situations involving uncertainty, interdependence, and potential opportunism (Larzelere & Huston, 1980). Trust is closely linked to the belief in positive consequences that can result from engaging in transactions and is also vital in the establishment and maintenance of partnerships between organizations, both in the initial stages and the continuity of relationships where uncertainty is high (Crosby et al., 1990). Levels of trust correspond to perceived risks, and lack of trust can lead to the rejection of transactions because of the potential negative outcomes associated with them.

There was considerable division in the literature as to whether trust should be measured through one or more dimensions. Over the years, trust has been studied more and more and for specific fields such as e-commerce. When it became clear from the literature that trust is a multidimensional construct consisting of benevolence, integrity and competence, Chen and Dillon tested it within the e-commerce environment. Chen & Dhillon (2003), found a significant effect on all three dimensions as the recurring themes in establishing trust for e-commerce which is conceptualized as overall trust but is made measurable through the three dimensions. Where benevolence means the belief that the person in charge genuinely wants the best for others and isn't just looking out for themselves. Integrity involves believing that the person in charge follows a set of principles that match the values of the person trusting them. Lastly, competence means that the person trusting believes in the skills, knowledge, and capabilities of the one in charge to make an impact in a specific area. The model was first created to assess the intention to purchase but was later applied by Ozdemir and Sonmezay (2020) where they found the same results that trust based on the three dimensions has a significant effect on customer loyalty. Several studies (Kesuma et al., 2021; Ozdemir & Sonmezay, 2020) have proven that trust is an important factor in determining loyalty which is consistent with the STM model of Alsajjan (2014) and the theory in a B2B context of (Rauyruen & Miller, 2007). Therefore, the following hypothesis is developed:

H1: E-commerce SaaS trust has a positive influence on E-commerce SaaS loyalty.

Alsajjan, (2014) STM's model also proved that trust is a significant determinant of service satisfaction. To date, few studies have proposed that trust is a determinant of customer satisfaction. Indeed, some studies even propose no relationship between trust and satisfaction (Chou & Chiang, 2013). However, other researchers have found that trust has a significant impact on customer satisfaction (Alsajjan, 2014; Kesuma et al., 2021; Mishra et al., 2023). Therefore, an extra hypothesis for trust is made:

H2: E-commerce SaaS trust has a positive influence on E-commerce SaaS satisfaction.

2.2.2 E-commerce SaaS satisfaction

Satisfaction can be understood as the extent to which a consumer feels that using a service generates positive emotions. (Tam, 2004). Within the realm of SaaS, this notion suggests that the level of customer satisfaction hinges upon whether the service provider fulfills the anticipated characteristics at the time of software usage (Chou & Chiang, 2013; Tam, 2004). When creating a product or service, it becomes crucial to prioritize customer satisfaction. This is due to the heightened expectations of customers in today's highly demanding environment, where ignoring their expectations is not a viable option (Kim et al., 2009). According to the research, businesses have the potential to increase their profits by ensuring customer satisfaction with their offerings. This satisfaction can lead to customers becoming advocates who spread positive word-of-mouth recommendations and effectively acting as representatives for the company (Shil et al., 2010). This study defines satisfaction as a set of beliefs about desired attributes of services that SaaS providers offer.

Satisfaction has been studied for years and therefore several models have been developed to study the construct either in its entirety or taking an important role within the model. In 1989, the TAM model was developed by Davis which explains consumer acceptance of IT technology by measuring factors that influence behavioral intentions (Davis, 1989) which in turn can be influenced by satisfaction and trust (Alsajjan, 2014). To test the behavioral intentions, the information systems continuance model was developed by Bhattacherjee (2001). The model was applied within the SaaS environment in 2010 where Benlian found that service quality and perceived usefulness are significant determinants of satisfaction, which in turn is a determinant of continuance intention (Benlian et al., 2010).

Satisfaction is identified by several researchers as the most important factor in determining loyalty (Kesuma et al., 2021; Mishra et al., 2023). Alsajjan's STM model indicates that satisfaction has a greater impact on customer loyalty than trust (Alsajjan, 2014). Previous beliefs and research have indicated that increasing customer loyalty is associated with satisfied customers who are more inclined to maintain their loyalty to the service provider, which means that when customers are satisfied with the product or service they receive, they (Alsajjan, 2014; Chou & Chiang, 2013; Mishra et al., 2023) are more likely to continue their business relationship with the service provider Therefore, it is crucial for e-commerce companies to understand the factors that impact satisfaction (Rauyruen & Miller, 2007). With promising evidence, in this study, it is hypothesized that:

H3: E-commerce SaaS satisfaction has a positive influence on E-commerce SaaS loyalty.

2.3 Identification of Contributing Factors

By reviewing prior research and relevant literature on customer loyalty, trust, and satisfaction, it is possible to develop a comprehensive set of (sub)factors that can be employed to assess the quality of the relationship and service provided by a SaaS provider. Alsajjan's STM model forms the biggest basis for measuring customer engagement. Identifying the factors influencing satisfaction and trust has been obtained from the various surveys that have emerged from the SLR, where Davis (1989) TAM and Benlian et al. (2014) SaaS-qual models have mostly been used as the basis or contribution to the studies.

The SaaS-Qual model has thus far presented the most extensive compilation of factors for measuring service quality. However, other studies have explored different factors to examine service quality, customer satisfaction, and relationships. Notably, Chou (2019) and Chen and Dillon have introduced novel (sub)factors through their surveys, aiming to gain fresh insights into the interrelationships among constructs such as service cost and trust. Chou referenced the SaaS-Qual model without replicating or modifying it, while Chen and Dillon (2003) drew upon various literature sources, including, to identify the three dimensions of trust. A recent study by Mishra et al. (2023) found several significant contributors to its continuance intentions which are applicable to this research.

Table 2 offers an overview of the factors covered in the existing literature, with corresponding explanations.

Service Qaulity	The difference between customers' expectations and their perception of actual service performance
Perveived usefulness	Gegree to which is believed that using a particular system would enhance job performance'
Perveived easo of use	How effortlessly or easily an particular technology or system can be used
Perceived value	The extent to which users believe that using the software as a service will provide benefits that justify its cost
Perceived risk	The ability to provide secure services and protect customer data
Trust	Collection of beliefs and expectations regarding specific attributes and future behaviour of the provider
Satisfaction	How satisfied is the customer with the service and provider
Loyalty	The willingness of consumers to repeatedly purchase products or services from the same provider in the future

Table 2: Most important concepts and their definitions based on literature.

2.3.1 Service Quality

Defining and measuring actual service quality (SQ) is a complex task, but researchers unanimously stress the importance of assessing it from the customer's point of view. Perceived service quality reflects the difference between customers' expectations and their perception of actual service performance (Tam, 2004). In other words, it evaluates how well the service provided matches what customers expect. Service quality has been extensively researched and is used in different contexts. Parasuraman (1991) performed practical investigations in diverse sectors to establish and enhance SERVQUAL, a questionnaire with multiple items used to measure a customer's overall evaluation of a company's service quality for the offline/physical world. There has been a shift in recent years from measuring non-internet service quality to measuring internet service quality. Benlian stated ''Even though IT cost reductions, operational elasticity, faster upgrade cycles, and ease of implementation of SaaS were initially thought to be the drivers of success, service quality issues are increasingly becoming pivotal''(Benlian et al., 2010). Therefore, the SaaS-Qual model was developed and specifically designed for the SaaS industry.

This research follows SaaS-Qual of Benlian (2010), whereby service quality is conceptualized as rapport and flexibility. This refers to the performance aspects that are focused on the process and interaction which cannot be easily described in contracts. Whereby rapport refers to the comprehensive knowledge and understanding of the service provider, which is utilized to deliver effective support to the customers,

and flexibility as the freedom for customers to choose their desired functionalities, adjust, and scale the service according to their preferences. Service quality is seen within the service industry as an excellent predictor of customer satisfaction because it directly influences the overall evaluation and perception of the service customers receive. Companies focus on keeping their service quality high and protecting their reputation to ensure customer loyalty. This is important because if an established company's shortcomings and weaknesses become apparent, other companies can take advantage of them and pull customers away (Kesuma et al., 2021). When customers experience high service quality, it indicates that their expectations have been met or exceeded. This positive experience creates a sense of satisfaction and fulfillment that is confirmed by several studies, such as in the travel industry (Setó-Pamies, 2012), mobile services (Alsajjan, 2014), and SaaS industry (Benlian et al., 2010). With this evidence the following hypothesis is formulated:

H4a: Service quality has a positive effect on Satisfaction in Software-as-a-service providers.

Service quality plays a crucial role in creating trust. Service quality provides customers with expectations about the level of service they can expect from a company or organization. These expectations serve as the basis for initiating trust (Chen & Dhillon, 2003). Even before customers have direct experience with a service, their initial perceptions of quality can determine their level of trust (Alsajjan, 2014). Previous research has consistently shown that service quality has a significant impact on an individual's level of trust in a company or organization (Alsajjan, 2014; Chou & Chiang, 2013). Therefore, the following hypothesis is proposed:

H4b: Service quality has a positive effect on Trust in Software-as-a-service providers.

2.3.2 Perceived usefulness

The concept of perceived usefulness (PU) in relation to SaaS refers to an individual's perception of how much using the technology would enhance their job performance (Du et al., 2012) which is in line with Davis (1989) definition of "the degree to which a person believes that using a particular system would enhance his or her job performance''. It reflects perceptions of how well a particular offering contributes to achieving organizational goals, improving efficiency, or enhancing operational effectiveness. Although perceived usefulness focuses primarily on the outcome for the individual rather than the organization, it can still be relevant when evaluating relationships between firms, particularly when examining the usefulness and effectiveness of the products, services or technologies exchanged between them (Hussein et al., 2019). Measuring perceived usefulness provides a valuable perspective in the context of business relationships because it provides insight into the degree of practical benefits, effectiveness, and usability of the SaaS solution. Perceived usefulness regarding e-commerce SaaS refers to the extent to which users of the software as a service perceive it to be beneficial in enhancing their e-commerce activities such as managing online sales, inventory, and customer relations. Ultimately, the perceived usefulness of e-commerce SaaS can impact the success of a business's e-commerce operations (Eid, 2011). In the field of technology acceptance, scholars generally agree that perceived usefulness is a crucial factor that influences users' behavioral intention to use technology (Mishra et al., 2023; Venkatesh & Davis, 2000). A review of the TAM model indicates that out of nineteen studies that assessed the relationship between perceived usefulness and behavioral intention, sixteen found a significant effect, while only three did not (Legris et al., n.d.). Bhattacherjee (2001) uses perceived usefulness in his continuance model as a key determinant of satisfaction. Whereas Benlian found the same significant effect within a SaaS context in 2010 (Benlian et al., 2010). Based on this evidence the following hypothesis is developed:

H5a: Perceived usefulness has a positive impact on Satisfaction in Software-as-a-service providers.

Although this has not been tested in a SaaS context, it is believed that perceived usefulness also influences trust. When users see that a system is useful and reliable in delivering the expected benefits, a sense of trust in the capabilities and reliability of the system develops (Davis, 1989). Trust is based on the belief that a system will consistently deliver the promised value and that the user's interests will be protected (Chen & Dhillon, 2003). The perceived usefulness of a system could play a crucial role in establishing and reinforcing this trust. Based on this we put forward the following hypothesis:

H5b: Perceived usefulness positively impacts trust in Software-as-a-service providers.

2.3.3 Perceived ease of use

In the field of technology, the consensus is growing that ease of use plays a crucial role in influencing individuals' intention to use a particular technology (Du et al., 2012). Perceived ease of use (PEOU) refers to the subjective assessment of how effortlessly or easily an individual can use a particular technology or system (Davis, 1989). It involves the perception of simplicity, clarity and user-friendliness of the interface and interactions. Perceived ease of use reflects the perceived degree of effort required to learn and effectively use the technology. It is part of the TAM model where it measures the intention to use a particular technology together with perceived usefulness. Moreover, the ease-of-use factor indirectly influences behavioral intention to use a technology by shaping users' perceptions of the technology's usefulness (Chou & Chiang, 2013; Davis, 1989). The perceived ease of use is comparable with the feature dimension of Benlian et al. (2014) SaaS-Qual model, where he sheds a light on users' interface and operability. Perceived ease of use is seen as a significant determinant of satisfaction. When users find a SaaS system easy to use, it enhances their overall satisfaction with the service. Eid (2011) found support for this in a B2C ecommerce context, and Benlian et al. (2010) found the same results in a B2B context. Given the predominant acceptance of the causal relationship between perceived ease of use and perceived usefulness and satisfaction, we propose that:

H6a: Perceived ease of use has a positive impact on the perceived usefulness for the software in use.

H6b: Perceived ease of use has a positive impact on satisfaction in Software-as-a-service providers.

2.3.4 Perceived value

Perceived value (PV) in terms of SaaS refers to the extent to which users believe that using the SaaS will provide benefits that justify its cost (Zeithaml, 1988). Early academic literature has highlighted the significance of perceived value in relation to purchase intentions (Boksberger & Melsen, 2011; Tam, 2004; Zeithaml, 1988). Perceived value considers the overall value and desirability and differs from perceived usefulness, which specifically examines the extent to which the offer is perceived as useful and valuable in achieving specific goals or fulfilling specific needs (Davis, 1989). Studying perceived value can provide insight into the overall value and desirability of the products, services or solutions exchanged between companies. It includes evaluating the benefits received relative to the costs incurred, considering factors such as quality, features, support and long-term benefits (Tam, 2004).

In academic research, there has been discussion on the distinctions and connections between perceived value and customer satisfaction. Customer satisfaction refers to the overall positive or negative feeling customers have about the net value of the services they receive from a supplier. Perceived value, on the other hand, represents customers' understanding and perception of the relational exchanges they have

with their suppliers (Zeithaml, 1988). It includes their cognitive evaluation of the benefits resulting from the relationship (Oliver, 1976). Satisfaction, in turn, represents customers' overall emotional response and sentiment because of their perceived value (Yang & Peterson, 2004). Yang and Peterson found in their study that based on behavioral models, it is understood that affect or emotional response is significantly influenced by cognition or the cognitive evaluation of the situation. Empirical evidence supports the idea that customer-perceived value has a positive impact on customer satisfaction with a supplier (Boksberger & Melsen, 2011; Tam, 2004). Studies have shown that when customers perceive high value in the products or services they receive, they are more likely to be satisfied with the supplier. Therefore, the following hypothesis are proposed:

H7a: Perceived value has a Positive impact on satisfaction in Software-as-a-service providers.

H7b: Perceived value has a positive impact on trust in Software-as-a-service providers.

2.3.5 Perceived Risk

Perceived risk (PR) is closely related to security which is a component of the SaaS-Qual (Benlian et al., 2014). The impact of security as a factor in e-commerce SaaS adoption has produced mixed results in previous literature. While Benlian et al. (2010) identified security as the second most significant factor, other studies have not explicitly included security as a factor in their research but still recognized its importance (Chou & Chiang, 2013; Freitas & Neto, 2017). Perceived risk regarding e-commerce SaaS refers to the extent to which users of the software perceive it to be secure in handling sensitive information, such as financial and personal data. It is a subjective measure that assesses the user's perception of the software's ability to protect their information from unauthorized access, use, disclosure, and modification. Rahman (2022) stated that when the perceived risks associated with adopting SaaS solutions decrease and the perceived benefits increase, organizations are more likely to enhance their trust in adopting such solutions. By recognizing the decrease in perceived risks and increase in perceived benefits, organizations are more likely to overcome their reservations or hesitations and feel more confident in implementing or persisting with SaaS solutions. This increased confidence enables organizations to fully leverage the benefits and potential of SaaS in their operations, leading to improved efficiency, cost-effectiveness, and overall organizational performance (Heart, 2010). So, it is hypothesized that:

H8a: Perceived risk has a negative impact on Trust in Software-as-a-service providers.

Trust is influenced by the perception of risk. When there is trust, it creates an environment in which satisfaction can occur. Although certain literature assumes that the effect of perceived risk on satisfaction arises from trust (Heart, 2010). Benlian et al. (2014) assume that risk influences satisfaction in the SaaS-qual model. Therefore, this relationship is also tested separately in this study and the following hypothesis is established:

H8b: Perceived risk has a negative impact on satisfaction in Software-as-a-service providers.

2.4 Measurements and Relevance of factors

Now the determinants are identified, it will be explained how the independent variables are measured and what the transition is from the theory to SaaS using e-commerce firms. The SaaS-Qual model of Benlian et al. (2014) served mainly as the foundation for the measurement of the variables.

Service quality

Service quality is measured based on three dimensions of Benlian et al., (2014) which include reliability, rapport, and flexibility. In contrast to SaaS-Qual model which uses three more dimensions to measure service quality, this research focuses on reliability, rapport, and flexibility because the other three dimensions are better related to one of the other independent variables. Reliability assesses the customer's perception of how the service is delivered in a dependable and promised manner. Rapport in this context includes assurance and empathy, reflecting knowledge, support, aligned work styles, individual attention, and willingness to offer customized services. Flexibility refers to the supplier's openness to accommodate changes in contractual and functional aspects, giving clients freedom in the outsourcing relationship. The questions for the survey regarding rapport and flexibility are adapted from Chou (2019) who uses the SaaS Qual model of Benlian et al., (2014) as a foundation in his research on service quality on trust. The questions for reliability are adapted from the Saas-Qual model of Benlian et al. (2014).

The relevance of measuring the service quality for SaaS ecommerce is because the STM Model deemed is as a determinant of trust and satisfaction (Alsajjan, 2014) and the perception of service is seen as the most important factor for adoption and continuance of SaaS in studies in various context and therefore no exceptions for e-commerce is expected.

Perceive usefulness.

Perceived usefulness in the context of SaaS refers to an individual's subjective evaluation of how the use of the technology would positively affect their work performance. The questions in the survey are based on Davis' (1989) original questions. Four questions are used to measure the independent variable just as in comparable studies (Bhattacherjee, 2001; Du et al., 2012).

Given the many competitions binned by the providers of e-commerce software, customers often tend to look for automation of certain tasks. The fewer actions required for a task to fulfilled, the better it is perceived to be (Mishra et al., 2023). As a result, they experience less complexity and get to their desired goal faster.

Perceived ease of use

The perceived ease of use is an individual belief of how much effort is required to use a particular system or technology. For this study, the questions are retained from Du et al. (2012), who tested perceived ease of use in a SaaS context based on the questions developed by Davis in 1989.

The research of Mishra et al. (2023) identified the importance of ease of use on both satisfaction and perceived usefulness in their comprehensive literature review. The relevance for e-commerce SaaS companies is high. Users of the software obtain most of their online sales with it. Consequently, if the software is hard to learn or use, it could offset the benefits. Thereby, an easy-to-use system seen as a more useful one.

Perceive value

Perceived value refers to beliefs about the benefits they expect to receive from using the software, and whether those benefits outweigh the associated costs. The questions for the survey were adapted from Tam (2004). Although his questions are focused on the restaurant industry, we can shape the questions to SaaS context given the questions are based on Boksberger and Melsen, (2011) who did a critical examination and made perceived value measurable for the service industry.

Perceived value is an important component for SaaS e-commerce providers given the fierce competition. If customers find the price quality not good enough, they will easily make the choice to switch to another provider (Yang & Peterson, 2004). Therefore, it is interesting for a provider to know how valuable their service is perceived.

Perceived risk

Perceived risk in general encompasses a broad range of risks that customers may consider, such as security risks, data privacy concerns, reliability issues, vendor lock-in, system compatibility, legal and regulatory compliance, and financial risks. This study follows Benlian et al. (2010) who focused on data privacy concerns in the SaaS-Qual model. This makes it also applicable to the e-commerce industry because e-commerce SaaS providers handle a lot of sensitive info (personal and financial data). The questions in the survey are therefore based on (Heart, 2010).

The reason perceived risk is measured as a separate instrument rather than under service quality is that Benlian et al. (2010) see it as the second most important factor and this study looks at how it relates to trust rather than measuring it with multiple instruments associated with service quality that could potentially affect signification.
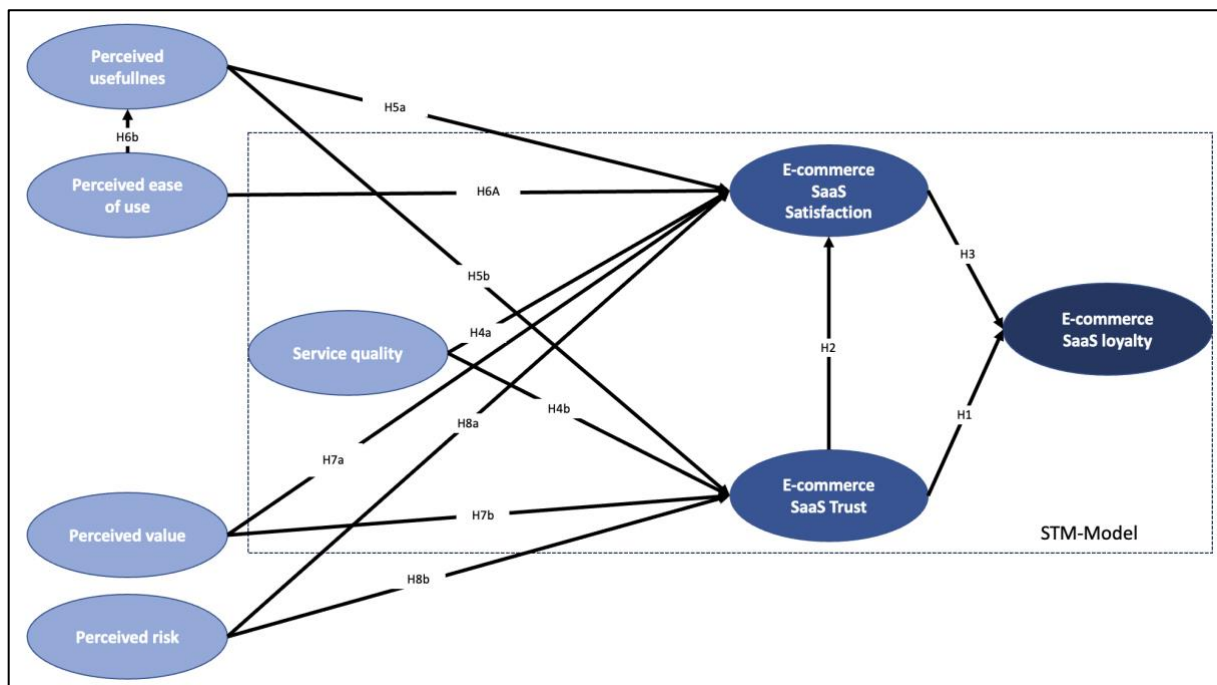
Figure 2: Research model based on (Alsajjan, 2014).

3.0   Method

The chapter on methodology provides a detailed explanation and description of the research methods utilized, including the research design and the collection and analysis of data.

3.1 Research design

This research aims to answer the question, *"How can e-commerce SaaS companies effectively measure loyalty in B2B relationships via trust and satisfaction?''*. The goal is to explore practical strategies and approaches that B2B e-commerce SaaS companies can use to measure service and relationship quality in relation to trust and satisfaction. For this purpose, research is conducted where a survey is used as the primary method followed up by in-depth interviews. Most survey questions are based on questions from previously validated studies such as Benlian et al. (2014), Chen & Dhillon (2003), Chou & Chiang (2013), and Chou (2019). A panel of experts consisting of two customer success managers, a sales manager, and a data security manager reviewed the instrument to ensure its validity and to identify any ambiguous items. Appendix B shows the relevance of each of the roles for the review of the instrument. A pilot test was conducted prior to collecting data for the field test. This pilot test is conducted among employees of FactFinder itself. The research instruments were tested for reliability, content validity and construct validity, and necessary changes were made to improve both the content and clarity of the questionnaire. To research the sample of this research the survey is made up via an online survey tool named Google Forms. An online survey tool is considered a convenient, quick, and flexible method (Evans & Mathur, 2018). The survey is made up in two different languages, namely English, German, and Dutch. The versions will be reviewed by one of the experts whose native language is German or English respectively.

3.2 Data collection

Singh, Taneja, and Mangalaraj (2009) have provided a comprehensive guide on survey development, highlighting key considerations in survey design. Following this guide allowed for an informed survey design approach.

For this study, the population consists of all users of Fact-Finder's SaaS products. As these users receive training and are known in the CRM system, they were considered for inclusion in the survey. The survey is distributed to the known email addresses of current Fact-Finder customers within the CRM system. To enhance response rates, a gift card was offered as a raffle prize. Non-respondents received a reminder email after one week, consequently if people did not respond, the researcher called them to get them to complete the survey. Duplicate responses were removed, and submissions were compared for similarities, following the guidelines outlined by Sing et al. (2009).

To ensure ethical compliance, the questionnaire was reviewed by the University of Twente before being sent to clients. Data collection was conducted through an online survey targeting Fact-Finder customers in Europe. Considering factors like time, cost, and flexibility, an online survey was deemed the most suitable approach to reach customers, as suggested by Granello & Wheaton (2004). Fact-Finder customers were contacted via email, where they were invited to participate in the survey and provided with a link.

3.3 Operationalization of sub-factors

The questionnaire is divided into two sections. The first section gathers nominal scale data, capturing basic information about the respondents and their respective firms, including industry type, position, annual revenues, number of employees, and the time elapsed since SaaS implementation. The second section focuses on assessing the respondents' subjective perception of SaaS usage. It employs a five-point Likert scale, where participants rate their agreement or disagreement on a range from 1 to 5. This scale allows for a more nuanced understanding of the respondents' perspectives on SaaS usage. From there, it is measured by 1 as the lowest score (i.e. totally disagree) and 5 as the highest score (i.e. totally agree) on the item scale.

The survey consists of 35 questions. Table 3 shows the relevant literature for the survey questions. Although much of this study is based on Alsajjan's STM model, the survey questions are not. In this study, Benlian's questions are used given Alsajjan's questions were focused on the mobile phone industry. The questions of Benlian are already based on SaaS, making them directly applicable to this study. The initial questions derived from existing literature, and which have been influential in subsequent research, are provided in Appendix C.

Independent variables	Service Qaulity	Benlian et al. (2010), Chou (2019)
	Perceived Usefullness	Davis (1989)
	Perceived ease of use	Davis (1989), Du et al. (2012)
	Perceived value	Tam (2004), Boksberger and Melsen (2011)
	Perceived risk	Benlian er al. (2010)
Constructs	Trust	Ozdemir, E. & Sonnemezay, M. (2020)
	Satisfaction	Bhattacherjee (2001)
	Loyalty	Bhattacherjee (2001)

Table 3: Main sources for variables and constructs question

3.3 Sampling selection

FactFinder usually reaches out to its European customers through email, utilizing the known email addresses stored in the CRM system. To ensure randomization, a maximum of 400 emails were selected as a sample. The survey includes a question regarding the respondent's job function, enabling the investigation of potential variations in satisfaction and trust across different roles. Key informants, individuals who play a significant role in generating online sales and have a strong connection to the software, are considered representative of the entire organization (Xiao et al., 2020). Individuals with positions such as CEO and Accounting were removed from the list. Considering the study has more of an operational focus, the CEO were removed because of their more strategic focus. Individuals who were no longer employed by the organization were also removed. After cleansing the data, a list of 298 email addresses remained which was spread across 175 companies.

Response rates are generally lower for online surveys than for other solicitation methods (Daikeler & Bo, 2020). The same study found that the average response rate is 12% shared across all methods, however, it is often lower for web-based surveys. The first e-mail containing the survey yielded few responses and so did the follow-up e-mail. Because of this, we first tried to contact the respondents by phone, which we believe (given the high measure of anonymity) resulted in about 12-15 responses. When the person in question could not be reached, a message containing the survey was sent via LinkedIn direct mail, which worked as the most effective communication tool for this study. "The greater effort on the part of the researcher and the personal contact makes it more difficult for the respondent to refuse to participate" (Daikeler & Bo, 2020).

3.4 Sample characteristics

The data in Table 4 describe the characteristics of the sample. From FactFinder, a random email list was created containing 400 email addresses of existing customers and corresponding contact persons. Of these, 295 email addresses were valid and usable for sending the survey. Of these, a total of 42 became usable for analysis, making a response rate of 14.2%. This is comparable with most mail surveys in IS studies, which have a range in response rates of 12.2% to 22.4% (Cho & Chan, 2015). The 295 email addresses were divided among 165 individual organizations. To find out how many unique companies we were able to identify, we looked at the company position of the respondents. In the address list only one ecommerce manager was listed per company, this allowed us to identify 14 individual companies initially. Then we linked the ecommerce managers to the industry in which they work. After this, we looked at where the remaining respondents differed from the combination "annual sales," "number of employees" and "implementation time''. From this, 33 unique companies were retrieved. Respondents who had entered other functions with equivalent values to the three aforementioned factors were considered as not unique. See Appendix D for the full table.

The industries the respondents work in is remarkably divided. However, this does provide more useful insights than if only all responses came from one industry. Food Retail is the largest with 7 different respondents, followed by DIY/wholesale (6) and Home Appliances/Furniture/Décor (5), which are also the largest industries in which FactFinder operates. The survey was mostly answered by E-commerce managers (14) followed by marketing managers (12) and product owners (11). However, a person may well have the job title of marketing manager, but perform the tasks done within other organizations by a position called product owner.

The turnover is not much divided, this was also to be expected in advance as FactFinder mainly serves larger organizations. Again, this is clearly reflected in the number of employees, where more than 75% have more than 250 employees and more than 80% of these have more than 500 employees. FactFinder often works with annual contracts with its customers, remarkably, more than half (58%) of the respondents indicated that FactFinder has been implemented for 3 years or more. This gives a first indication of loyalty in numbers.

Measure	Item	Frequency	Percentage
Industry	Food retail	7	17%
	Department store, Wholesale	6	14%
	Home Appliances, Furniture, Decor	5	12%
	Logistics	5	12%
	Hobby, Sporting goods	4	10%
	Medical Supplies Pharmaceuticals	3	7%
	Clothes, Shoes, Accessories	3	7%
	DIY, Gardening	3	7%
	Pet, Animal Supplies	1	2%
	Other…	5	12%
Position	E-commerce manager	14	33%
	Marketing manager	12	29%
	Products owner	11	26%
	ICT manager	2	5%
	Other…	3	7%
Revenue	€2.500.000 – €5.000.000	32	76%
	>€5.000.000	10	24%
Employees	50 – 99	4	10%
	100 – 249	6	14%
	250 – 500	6	14%
	More than 500	26	62%
Time after implementation	Less than 1 year	2	5%
	1 – 3 years	15	36%
	3 – 5 years	9	21%
	5 – 10 years	13	31%
	Longer than 10 years	3	7%

Table 4: Descriptive statistics of sample

4. Data and Results

This chapter is dedicated to examining the outcomes of the data analysis. These outcomes are used to answer the primary research question, which examines the factors that influence loyalty in B2B SaaS relationships. We begin by evaluating the appropriateness of the model and reflective measurement models before delving into the path coefficients. Furthermore, the results are clarified through validating interviews and, as a final step, we conduct a multigroup analysis.

4.1 Data analysis

To analyze the data, the research employed the Structured Equation Model (SEM) method and utilized the program Smart PLS-4. The SEM method was chosen as it is suitable for testing the multi-level research model depicted in Figure 2. By applying multivariate analysis in a holistic manner, the SEM method allowed for a comprehensive examination of the model. A partial least Square was then performed to confirm or reject the hypotheses. For formatting the descriptive data and group comparisons, the software program SPSS was used since Smart PLS-4 cannot display it.

Structural Equation Modeling (SEM) is a multivariate technique used to estimate interrelationships between variables simultaneously (Shaheen et al., 2017). SEM consists of two main models: the measurement model and the structural model. The measurement model represents the instruments or observed variables used to measure the underlying latent variables, the constructs of interest in this research (Figure 2). The first step involves validating the measurement model to ensure that the chosen instruments effectively capture the intended constructs. Next, the structural model is analyzed to test the hypothesized relationships between the constructs in the conceptual model of the study (Figure 2). This step allows for a comprehensive examination of the relationships between variables. To assess the overall fit of the initial SEM, Goodness of Fit (GOF) indicators are used. These indicators give an indication of how well the collected data matches the latent variables being measured.

4.2 Overall model fit

It is important to assess the overall goodness-of-fit of the estimated model. This can be achieved by conducting a bootstrap-based test to evaluate the model's overall fit and by using the standardized root mean squared residual (SRMR) as a measure of how closely the model approximates the data (Benitez et al., 2020). These assessments provide empirical evidence to support or challenge the proposed theory. Ignoring the model fit can lead to missing important effects. Although this evaluation is relatively new in PLS-PM research, it is essential. In our study, all discrepancies fell within acceptable limits, indicating good model fit. This suggests that the model is suitable for understanding the potential of loyalty through trust and satisfaction. However, it is essential to check for overcomplexity and assess all path coefficients, because neither the bootstrap test nor SRMR takes model heterogeneity into account.

The standardized root mean squared residual (SRMR), introduced by Henseler et al. (2014), serves as an indicator of how well a model approximates the data. A perfect fit corresponds to an SRMR value of 0. Henseler et al. (2014), suggests that the SRMR value should ideally be less than 0.08, but a threshold value of 0.10 is also mentioned for a more conservative approximation.

Initially, our model did not appear to meet the correct fit by scoring higher than 0.1 on the SRMR. However, after removing two items based on the criteria of item reliability (see section 4.3.1), the model does still not meet the threshold of 0.1 (See tables 5 and 6).

The SRMR is calculated based on the formula below, where p = number of observed variables, sij = observed covariances, $ôij$ = the reproduced covariances, sii and $sjjj$ are the observed standard deviations. So, from this, we can also explain that the model fit increases as we remove the lower scoring items but is still relatively high.

$$\text{SRMR} = \sqrt{\left\{2\sum_{i=1}^{p}\sum_{j=1}^{i}\left[(s_{ij} - δ_{ij}) / (s_{ii}s_{jj})\right]^{2}\right\} \div p(p + 1)}$$

	Original sample (O)	Sample mean (M)	95%	99%
Saturated model	0.121	0.092	0.112	0.124
Estimated model	0.129	0.101	0.125	0.137

Table 5: Model fit based on SRMR before removal of items

	Original sample (O)	Sample mean (M)	95%	99%
Saturated model	0.112	0.086	0.107	0.118
Estimated model	0.122	0.097	0.122	0.136

Table 6: Model fit based on SRMR after removal of items

When we applied bootstrapped confidence intervals to assess how well the model fits, we found that all the values were outside the 99% confidence interval. This suggests that the model fit is not very good. Researchers, as advised by Henseler et al. (2014) should be careful when reporting and using model fit measures in PLS-SEM because these criteria are still in the early stages of research. Despite not meeting the criteria for an exact model fit, we decided to proceed with our study.

4.3 Measures of Validity and Reliability

The measurement model for all eight constructs was assessed using partial least square (PLS), Unlike alternative methods, PLS has several advantages. It does not impose strict sample size requirements and does not assume that the data follow a multivariate normal distribution. To evaluate the significance of paths in PLS, an iterative series of factor analyses is performed. PLS uses a bootstrap approach, which estimates the t-value of paths using ordinary least squares. This iterative process helps assess the significance and strength of the relationships within the model.

4.3.1 Measurement model

Item reliability

First, it is necessary to assess indicator reliability, which indicates the extent to which a set of indicators maintains internal consistency in their measurements. Consistent with the work of Benitez et al. (2020) it is recommended that non-squared factor loadings exceed the threshold of 0.707, while squared factor loadings must exceed 0.499 to ensure indicator reliability.

Nevertheless, in our current study, as in an earlier 2011 study by Eid in a B2C context, a reliability threshold of 0.5 was used (Eid, 2011) (Fornell & Larcker, 1981). The reason for this choice is that a threshold of 0.707 would result in Service Quality consisting of only four items, rather than the nine items we retained. This choice is consistent with the perspective of previous research, in which three items for Service quality were deemed insufficient to accurately capture the nuances of the variable. It is noteworthy that none of the items examined showed a reliability coefficient below the threshold of 0.5. Ultimately, we decided to eliminate two items from the Service Quality construct and one from the perceived value construct. This decision was driven by our aim to ensure that our model and the Service Quality construct met the criteria for convergent validity. We followed a systematic process, starting with the items that had the lowest loadings, as the loadings were recalculated after each removal.

Construct reliability

In SmartPLS, the assessment of construct reliability, also known as composite reliability, involves the use of several metrics, including Cronbach's Alpha and Dijkstra-Henseler's rho (ρA). These metrics are measured on a scale of 0 to 1, with a higher value indicating greater reliability. As recommended by Benitez et al. (2020), Dijkstra-Henseler's rho (ρA) is preferred for this purpose. The formula for calculating ρA, is shown below, where $\hat{w}$ represents the estimated weight vector of the latent variable, $\hat{w}'$ denotes the number of indicators directly associated with the latent variable, n is the number of indicators directly associated with the latent variable within $\hat{w}$, and S represents the empirical covariance matrix of the indicator in question.

$$\rho_A = (\hat{w}'\hat{w})^2 * \frac{\hat{w}'\left(S - diag\left(S\right)\right)\hat{w}'}{\hat{w}'\left(\widehat{w}\widehat{w}' - diag(\widehat{\widehat{w}\widehat{w}'})\right)\hat{w}}$$

An optimal value for ρA is greater than 0.707 because this indicates that the latent variable has the capacity to clarify more than 50% of the variance observed in the construct. The values for ρA are presented in Table 7, all of which approach or surpass the threshold of 0.707. Collectively, these results affirm the reliability of the constructs examined.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
LOY	0.851	0.845	0.056	15.242	0.000
PEOU	0.931	0.924	0.107	8.725	0.000
PR	0.742	0.754	0.122	6.099	0.000
PU	0.670	0.684	0.092	7.246	0.000
PV	0.833	0.813	0.082	10.207	0.000
SAT	0.870	0.868	0.071	12.188	0.000
SQ	0.877	0.880	0.026	33.201	0.000
TRU	0.906	0.908	0.021	42.599	0.000

Table 7: Results of Dijkstra-Henseler's rho (ρA) for construct reliability

Convergent validity

Convergent validity controls how well items measuring the same construct are related to each other. To measure this, Average Variance Extracted (AVE) is often used. AVE tells us how much of the differences in measurements can be explained by the construct we are studying.

Benitez et al. (2020) suggest that if the AVE is at least 0.5, this is a good sign because it means that the construct can explain at least 50% of what we measure in each item.

Below is the formula to calculate this, with symbols such as ξj for the construct, λjk for how much each item is related to the construct, Kj for the number of items the construct measures, and Θjk for the differences or errors in the measurement of each item.

$$AVE\xi_j = \frac{\sum_{k=1}^{K_j} \lambda_{jk}^2}{\sum_{k=1}^{K_j} \lambda_{jk}^2 + \Theta_{jk}}$$

All alpha values and composite reliabilities (CRs) were clearly above or close to the recommended benchmark of 0.700. The mean-variance extracted (AVE) and CRs showed values higher or approaching 0.500 and 0.700, respectively, indicating that the different measures were consistently matched and reflected the expected relationships, confirming convergent validity.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
LOY	0.763	0.758	0.058	13.180	0.000
PEOU	0.728	0.722	0.054	13.594	0.000
PR	0.627	0.621	0.065	9.640	0.000
PU	0.604	0.605	0.060	10.029	0.000
PV	0.515	0.512	0.050	10.270	0.000
SAT	0.717	0.715	0.048	14.980	0.000
SQ	0.525	0.524	0.050	10.586	0.000
TRU	0.661	0.658	0.048	13.784	0.000

Table 8: Results of reliabilities and AVE

Discriminant validity

Finally, the cross-factor loadings of all items were revised to check the discriminant validity. Discriminant validity involves ensuring that two hidden variables, which are intended to represent distinct theoretical concepts, are statistically different enough from each other. We see that all factor loadings are larger than their cross-factor loadings, which is a sign of discriminant validity. The corresponding table is standing in Appendix F. Additionally, discriminant validity is measured in SmartPLS via the the Fornell and Larcker method and the Heterotrait-Monotrait Method (HTMT). According to Benitez et al. (2020) it should only be measured based on HTMT method. For the HTMT the correlations between different constructs (heterotrait) must be lower than the correlations within the same construct (monotrait). In other words, the HTMT ratio for each pair of constructs should be lower than 0.85. In Table 9 the relevant table is shown. Although one of the values does not meet the criterion of the HTMT method of being less than .085 which is recommended, is it still significant and useful since it is less than 1 (Benitez et al., 2020)

	LOY	PEOU	PR	PU	PV	SAT	SQ	TRU
LOY								
PEOU	0.858							
PR	0.821	0.582						
PU	0.597	0.626	0.441					
PV	0.851	0.541	0.927	0.473				
SAT	0.898	0.875	0.588	0.529	0.606			
SQ	0.883	0.704	0.858	0.698	0.730	0.785		
TRU	0.809	0.547	0.734	0.567	0.688	0.723	0.817	

Table 9: Discriminant validity based on the Heterotrait-Monotrait matrix

4.4 Hypothesis testing structural model
4.4.1 Structural model

In previous chapters, we established hypotheses. A null hypothesis implies the opposite of the other hypotheses, meaning that a null hypothesis suggests that there is no effect. These hypotheses will be tested based on path coefficients and their corresponding confidence intervals. Path coefficients (indicated in Table 10) are standardized regression coefficients, that express the degree of change in the standard deviations of the dependent variable when an independent variable increases by one standard deviation, holding all other variables constant. To assess and interpret significance, we use the P-value, a low P-value (typically less than 0.05) suggests that the results are statistically significant and that there is likely to be an effect or difference. The outcomes of this analysis are comprehensively displayed in Table 10. For a more detailed explanation of the results see Appendix G.

	Hypothesis	path coefficient	Standard deviation	T-statistic	P-value	Results
H1	TRU -> LOY	0.364	0.123	2.973	0.001**	Supported
H2	TRU -> SAT	0.287	0.171	1.833	0.046**	Supported
H3	SAT -> LOY	0.546	0.099	5.495	0.000***	Supported
H4a	SQ -> SAT	0.561	0.184	2,989	0.000***	Supported
H4b	SQ -> TRU	0.520	0.147	3.537	0.000***	Supported
H5a	PU -> SAT	0.115	0.155	0.738	0.230	Not supported
H5b	PU -> TRU	0.200	0.110	1.826	0.032**	Supported
H6a	PEOU -> SAT	0.561	0.118	4.737	0.000***	Supported
H6b	PEOU -> PU	0.489	0.107	4.592	0.000***	Supported
H7a	PV -> SAT	0.036	0.157	0.227	0.410	Not supported
H7b	PV -> TRU	0.236	0.136	1.727	0.041**	Supported
H8a	PR -> SAT	0.032	0.150	0.213	0.416	Not supported
H8b	PR -> TRU	0.074	0.082	0.476	0.317	Not supported

Table 10: Hypothesis testing ($* p < 0.1.$ $** p < 0.05.$ $*** p < 0.001$)

As presented in table 10, H1, H2 and H3 are supported which means they are statistically significant. The path coefficient for Trust (TRU) on Loyalty (LOY) is 0.364, meaning that LOY moves 0.364 standard deviations when TRU moves one standard deviation. In simple words, When Trust increases by one unit (typically one standard deviation in statistical terms), Loyalty tends to increase by approximately 0.364 units as well. Adding to this, we see a p-value equal to 0.001. This implies that it is high confidence of the effect trust on satisfaction, however had the P-value been even lower like that for satisfaction on loyalty there was even higher confidence of the statistical test. We see a higher path coefficient (0.546) for the effect of satisfaction (SAT) on loyalty (LOY) than for that of trust. this implies, the higher the path coefficient, the stronger the relationship or influence between the variables it represents.

Another important effect measured is that of Trust (TRU) on Satisfaction (SAT). This revealed a Path coefficient of 0.292, with a p-value of less than 0.05 which is statistically significant. To make sure it was measured in the right direction, the effect was also measured the other way around (Sat --> Tru). This resulted in an insignificant effect with a path coefficient of 0.204 and a p-value of 0.066.

H4a and H6a are the hypothesis confirmed with an effect on satisfaction (SAT). With a high path coefficient of 0.561, there is enough statistical evidence (p<0.05) to speak of a significant effect of service quality (SQ) on satisfaction (SAT). The same is true for Perceive ease of use (PEOU) which, with a high path coefficient of 0.561 and corresponding p value of less than 0.001, reflects that there is a high degree of confidence of an effect on satisfaction.

On Trust (TRU) the path coefficients are relatively somewhat lower than on Satisfaction (SAT). On the other hand, however, there are three statistically significant effects on trust. These are the effects of Service quality (SQ) with a path coefficient of 0.520 and P-value of <0.05, Perceived ease of Use (PEOU) with a path coefficient of 0.489 and p-value of <0.001 and Perceived usefulness with a path coefficient of 0.236 and p-value of <0.05.

For hypotheses H5a, H7a, H8a and H8b, too little statistical evidence was found to be supported. This is also reflected in the path coefficients. The path coefficients for each of the unconfirmed hypotheses are: Perceived usefulness on satisfaction 0.115, Perceived Value on Satisfaction 0.036, Perceived risk on Satisfaction and Trust 0.032 and 0.074 respectively.

The graphical output of the PLS is on the following page (Figure 4) with corresponding p-values. The hypotheses and the respective significance and directions are summed up below:

H1: Trust has a significant (P<0,05) positive direct effect on Loyalty

H2: Trust has a significant (P<0,05) positive direct effect on Satisfaction

H3: Satisfaction has a significant (P<0,001) positive direct effect on Loyalty

H4a: Service quality has a significant (P<0,001) positive direct effect on Satisfaction

H4b: Service quality has a significant (P<0,05) positive direct effect on Trust

H5a: Perceived usefulness has a significant (P<0,05) positive direct effect on Satisfaction

H5b: Perceived usefulness has a significant (P>0,05) positive indirect effect on Trust

H6a: Perceived Ease of Use has a significant (P<0,001) positive direct effect on Satisfaction

H6b: Perceived Ease of Use has a significant (P<0,001) positive direct effect on Perceived usefulness

H7a: Perceived value has a non-significant (P>0,05) positive indirect effect on Satisfaction

H7b: Perceived value has a significant (P<0,05) positive direct effect on Trust

H8a: Perceived Risk has a non-significant (P>0,05) positive indirect effect on Satisfaction

H8b: Perceived Risk has a non-significant (P>0,05) positive indirect effect on Trust

Because the proposed relationships of perceived risk did not result in any significant effect both on satisfaction and trust, we examined what direct influence this factor has on loyalty. The relevant figure of this can be found in Appendix H. Here it was observed that the relationship of perceived risk has a direct significant (P<0,05) influence on loyalty.

Benitez et al. (2020) indicates that measuring effect sizes is important for PLS-SEM, however, this is not applicable in all cases as in this study. In this study, the emphasis is on discovering determinants and less on measuring effect sizes. This stems from the fact that the focus is primarily on exploring relationships between variables and identifying causal factors. Moreover, this approach is based on the idea that the determinants studied have not often been tested in combination on loyalty before, meaning that exploring these relationships is of great importance from a theoretical point of view.

Variance explained R²

The results of the PLS analysis provide insights into the variance explained by different factors. For instance, the R² value for Perceived Usefulness (PU) is 0.240, indicating that 24% of the variance in perceived usefulness can be attributed to the perceived ease of use (PEOU) variable.

When examining the influence of independent variables on satisfaction (SAT), we find an R² of 0.673. This suggests that a substantial portion, specifically 66.9%, of the variation in satisfaction is accounted for by Trust (TRU), Service Quality (SQ), and Perceived Ease of Use (PEOU). Additionally, Trust (TRU) itself has an R² of 0.645, meaning that 64,5% of the variance in trust is primarily explained by Service Quality (SQ), Perceived Ease of Use (PEOU), and Perceived Value (PV).

Moreover, when assessing the influence of both satisfaction and trust on loyalty (LOY), we see the highest R² value of 0.686. This means that a significant part, or 68.6%, of the variation in customer loyalty can be explained by their satisfaction and trust levels.
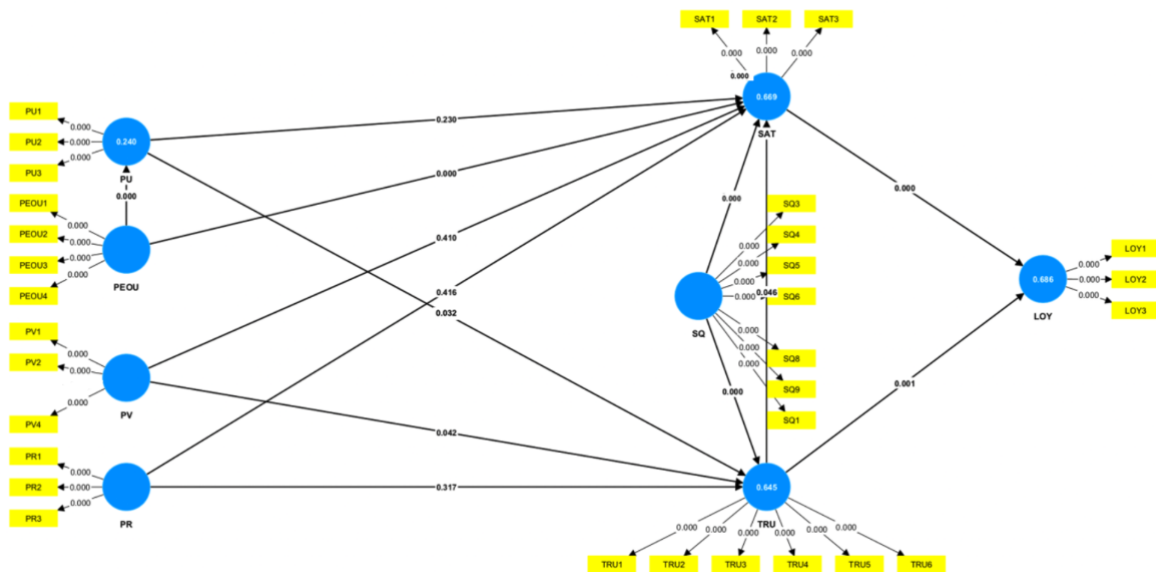
Figure 3: Partial least square graphical output

Multi-group analysis

In the final stage of our analysis, we conducted an evaluation of significant differences that emerged after the implementation of FactFinder. We sought to understand how customer perceptions of various factors relate to satisfaction, trust, and loyalty. To achieve this, we employed independent sample t-tests.

For this analysis, we categorized implementation time into two groups: "Less than 5 years" (comprising "Less than 1 year," "1-3 years," and "3-5 years") as Group 1, and "5 years or more" (encompassing "5-10 years" and "Longer than 10 years") as Group 2.

Our findings revealed a noteworthy difference in the perceived trustworthiness of FactFinder between these two groups. Specifically, individuals who had been using the software for more than 5 years tended to perceive FactFinder as more trustworthy than those who had used it for less than 5 years (mean difference = 0.55833, t-value = -2.967, p = 0.005) (see table 11). However, it's crucial to note that no other statistically significant differences were observed in our independent sample t-tests, as detailed in Appendix I.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p			Lower	Upper
SAT	Equal variances assumed	.223	.640	-1.688	40	.050	.099	-.37660	.22310	-.82750	.07430
	Equal variances not assumed			-1.625	28.134	.058	.115	-.37660	.23169	-.85110	.09790
TRU	Equal variances assumed	1.303	.260	-2.967	40	.003	.005	-.55833	.18819	-.93867	-.17800
	Equal variances not assumed			-3.171	38.151	.001	.003	-.55833	.17608	-.91474	-.20193
LOY	Equal variances assumed	.039	.844	-.446	40	.329	.658	-.10897	.24432	-.60276	.38482
	Equal variances not assumed			-.461	35.170	.324	.648	-.10897	.23654	-.58909	.37114

Table 11: Independent Sample t-test between implementations times

We extended a similar comparison to investigate whether company size, as indicated by the number of employees, influenced perceptions of satisfaction, trust, or loyalty. This entailed grouping companies into two categories: Group 1 included those with "50-99" and "100-249" employees, while Group 2 consisted of companies with "250-500" employees and those with more than 500 employees. Surprisingly, our analysis did not reveal any significant differences in perceptions of satisfaction, trust, or loyalty. A comprehensive presentation of these results can be found in Appendix G.

4.3 Validation of research results

After conducting the survey, follow-up interviews were conducted with those who left their emailadres. Follow-up interviews complement surveys by providing a deeper understanding of respondents' perspectives, clarifying survey responses and revealing valuable insights that may not have been obtained through quantitative data alone. They play a crucial role in improving the quality and reliability of survey results. The structure and questions of the interview are mentioned in Appendix J.

Interviews

Table 12 shows the key quotes from the four conducted interviews, followed by a application of open, axial and, selective coding methods (see Appendix J for the detailed coding scheme). This process not only validated the survey results but also provided in-depth insights into factors influencing relationships and the reasons behind certain connections.

The interviews revealed general satisfaction with FactFinder's operational functionality on the backend. However, a recurring issue is the lack of usefulnes, which requires training and consultant support. Further, trust and satisfaction emerged as critical to maintaining robust relationships, with consultants playing a central role as the first point of contact. Consistency in points of contact was highly valued to foster good relationships. Key elements for achieving service quality included transparent communication, reliability, and responsiveness. In addition, consistency appears to be a key component in various forms such as innovation, value delivery, and knowledge.

1	Trust is a kind of foundation for satisfaction because it makes you believe that they consistently deliver on their promises	Consistent delivery	promises	Satisfaction
1	It's important that there's a lot of guidance for operating the software, employee competency	Guidance for operating	Use competency support	Competence
1	Responsiveness, reliability and how well they handle problems all play a crucial role in determining satisfaction,	Responsiveness, reliability, problem handling	Service quality Factors	Quality
2	The people behind the fact Finder know what to do and know how ecommerce works.	People know what to do	Employee competency	Competence
2	It's important to have a timely and qualified response.	Timely and qualified response	Effective communication	Quality
3	It seems to me that when FactFinder understands our business goals, it also adjusts all training and onboarding conversations accordingly	Adjusted Training and onboarding conversations	Customer centric approach	Alignment
3	Combination of a user-friendly platform and reliable, responsive individuals contributes to a satisfying partnership with a SaaS provider.	Combination of platform and competence employees	Satisfying partnership	Satisfaction
4	The consultancy aspect. It's not just about providing a product; it's about guiding us in making the best use of it.	Consultancy guiding	Value enhancement	Alignment
4	So, having FactFinder understand our business goals is vital because it allows us to harness this flexibility and tailor the solution to our needs effectively.	Understand Business Goals, Flexibility, Tailor Solution	Business alignment	Alignment
4	FactFinder's consistency and continuous innovation have set it apart throughout our long-standing partnership.	Consistency, Continuous Innovation, Long-standing Partnership	Partnership factors	Alignment
4	I know many of their colleagues, and the fact that they are located in Germany means we've had numerous face-to-face meetings in the past. It's not like dealing with just any software company somewhere across the world.	German located, face-to-face meetings	Personal relationships	Alignment

Table 12: selection of codes from validating interviews

Through interviews and subsequent analysis, we developed a thorough understanding of the issues that were discussed. This research revealed specific recurring themes - reliability, competence, quality, alignment, and satisfaction - that emerged from the coding process of the interviews. Importantly, these themes areas were consistent with the results of our survey studies. The validation interviews thus provided a deeper exploration of the factors that contributed to satisfaction among respondents. They allowed us to examine respondents' expectations about various facets of SaaS and revealed the main causes of service-related dissatisfaction and respondents' preferences in this area.

5.0 Analysis of Results

This chapter summarizes the main findings of this study. Here the findings are supported by theory and possible explanations are given for unproven relationships.

The results have supported the premise that within the SaaS industry, trust and satisfaction are important factors in determining loyalty which is in line with theories of Alsajjan (2014), Baumann et al. (2022) and Crosby et al. (1990). However, the results indicate that satisfaction has a stronger impact on this compared to trust, which aligns with previous studies exploring their roles in various technology contexts like the banking industry, mobile phone providers, and internet services (Alsajjan, 2014; Kesuma et al., 2021; Mishra et al., 2023). In addition, the results indicated that the stronger relationship between satisfaction and loyalty can be attributed to the immediate and tangible benefits of the software and service that customers directly experience and benefit from. Trust, on the other hand, is built over time through consistency and results (Chen & Dhillon, 2003). Additionally, both the results and validation interviews show that trust positively influences satisfaction, consistent with earlier research (Kim et al., 2009; Mishra et al., 2023). Furthermore, we observe the significance of trust in the provider, which aligns with the findings of Rauyruen & Miller (2007) B2B research among which trust is seen under attitudinal loyalty considering it falls under a cognitive or emotional response (Chestnut & Jacoby et al., 1978). Our results primarily indicate a high level of attitudinal loyalty characterized by substantial levels of satisfaction and trust.

The study primarily assessed behavioral loyalty through survey questions about continued software use and relationship development. Interestingly, the figures for behavior-based loyalty were relatively lower than those for attitudinal loyalty. Despite the lack of statistically significant differences, it seems that attitudinal loyalty should be more focused on. This contradicts the findings of Al-Haraizah & Al-Nady (2015), which highlight behavioral loyalty as the only central dimension in e-commerce, although the current study does not involve a SaaS provider. Although this study did not measure both dimensions directly, their joint impact seems clear, as the marketing literature dictates since the research of Jugenheimer (1979).

In examining the other measurable dimension between brand-oriented and individual-oriented, this study leans toward the brand-oriented perspective. It specifically evaluates software characteristics and their influence on loyalty. Jugenheimer (1979) theory also suggests that if specific characteristics of individual users are measured, it would be more toward individually oriented measurements, such measurements were not conducted in this study.

The research highlights that service quality significantly impact customer satisfaction in B2B relationships, aligning with prior studies by Benlian et al. (2014) and Chou & Chiang (2013). The contribution of service quality, characterized by attributes such as responsiveness, flexibility, and reliability, plays a crucial role in increasing customer satisfaction. Customers usually expect proper service from knowledgeable personnel. Although not much evidence has been found, there is a preference for native language services and having a regular point of contact. These findings are consistent with Benlian et al. (2014) research, where responsiveness is most important, followed by flexibility and reliability.

In addition to service quality, perceived ease of use is an important determinant of satisfaction. Once a system is in use, people want to use it immediately and be able to align it with their business goals. The interviews show that opportunities can be missed at the point when the system is not easy to use. When users can do more with less effort, they feel more satisfied with technology (Mishra et al., 2023). The interviews reflect exactly what Baumann et al. (2022) confirmed in its research that the Ease of use determines usage continuance.

Davis' (1989) well-established Technology Acceptance Model (TAM) suggests that a user-friendly system significantly influences how users perceive its usefulness. Our research underscores this connection by demonstrating a robust link between system ease-of-use and perceived usefulness. The alignment observed between perceived ease of use and perceived usability underscores the similarity between the TAM (Technology Acceptance Model) and the post-acceptance model (Mishra et al., 2023). This strong relationship seems partly based on effective training and consulting services. These services enable users to become more proficient with the system, leading to improved operational efficiency. In turn, consistently delivering on these aspects fosters trust, aligning with Crosby et al. (1990) theory. When SaaS providers consistently provide value, meet expectations, and align with client objectives, trust naturally develops.

Although prior theories by Bhattacherjee (2001) and Tam (2004) in a B2C context and Boksberger & Melsen (2011) in a B2B context have reported positive effects of perceived usefulness and perceived value on customer satisfaction, our study yielded contrasting results. This discrepancy could be attributed to the fact that these two factors primarily emphasize economic value rather than functional aspects. Questions in the survey about perceived usefulness and value are mainly related to the long-term value of the software. The low influence of these two factors seems to arise because users of the software primarily pay attention to the practical functionality that the software provides for their satisfaction. Another reason for the non-significant effects could be that the survey was mostly completed by customers who have been using the software for an extended period, so the real differences in profitability and productivity may not be as present as opposed to briefly using customers and therefore mostly looking at functionality. To date, few recent studies have measured these effects, but perceived usefulness and perceived value appear to be important determinants of loyalty (Hussein et al., 2019; Yang & Peterson, 2004). The lack of ability to establish a clear relationship between perceived usefulness and satisfaction contradicts the well-established Technology Acceptance Model (TAM) of Davis' (1989) . This extensively validated model considers perceived usability and ease of use as the primary factors influencing a single variable, attitude (which in our study corresponds to satisfaction). A similar scenario unfolds with perceived value, often used in many contexts as the only determinant for measuring satisfaction or loyalty (Yang & Peterson, 2004). The inclusion of additional factors, especially when further decomposed into economic and functional aspects, may have contributed to the insignificance of these relationships. Therefore, it is essential to be cautious about stating that there are no relationships among these factors. An often discussed and important issue relates to the SaaS vendor's understanding of business objectives. Both the interviews and survey responses show a neutral attitude toward this issue, suggesting that it may have a moderate impact on productivity due to occasional misalignment between service quality and precise customer requirements. Theories such as Benlian et al. (2010), Freitas & Neto (2017) underscore the importance of this alignment in promoting satisfaction.

Trust is based on three influential factors: perceived usefulness, service quality and perceived value. Previous research, as demonstrated by Alsajjan (2014) in the mobile service industry, has shown that high service quality leads to more trust. In this study, the relationship is slightly stronger than that with satisfaction, this is mainly due to the quick and effective resolution of customer issues, which builds trust (Heart, 2010). The impact of service quality seems to stem primarily from reliability and responsiveness, which is consistent with insights from Benlian' (2014) theory. Benlian's theory also underscores the importance of perceived usefulness, stating that it contributes to the initial establishment of trust in B2B relationships. However, the development of trust over time is influenced by several factors, including consistent service, responsiveness, alignment with organizational goals, shared objectives, open communication, and supplier compliance with contractual obligations. Consequently, the combination of service quality factors and the efficiency and effectiveness achieved with the software seems to play a crucial role in further building up trust (Chen & Dhillon, 2003). This underscores the importance of perceived value as a crucial factor for trust. Although the survey indicates a slightly weaker but significant relationship between perceived value and trust, insights from interviews and theoretical underpinnings highlight the essential role of perceived value in the formation of trust. This contribution is primarily linked to economic value, emphasizing the importance of what the service provides rather than ease of use (Zeithaml, 1988).

In this study, perceived risk emerges as an indirect determinant, as it has no direct impact on trust and satisfaction with e-commerce software providers. This finding contrasts with Benlian' et al. (2014) theory, which positions perceived risk as a significant factor for satisfaction in the SaaS industry. Eid' (2011) study, conducted in a B2C context, showed that perceived risk only affects trust and not satisfaction. The lack of significant impact in our study seems to be rooted in the assumed credibility of SaaS providers, supported by certifications such as GDPR compliance and employee data security expertise, which are taken for granted and do not significantly contribute to satisfaction or trust (Heart, 2010). In the field of information technology, cloud computing has become a dominant topic in recent years. As a result, providers must comply to increasingly strict information security standards (Butt et al., 2023). By successfully meeting these requirements, individuals continue to recognize the importance of security, but have developed confidence in the provider's ability to ensure it and no longer see it as a major obstacle, especially with the implementation of a hybrid cloud (Seifert et al., 2023). It is worth noting that in the event of a data breach, both trust and satisfaction would likely plummet. Moreover, our study suggests that perceived risk has a direct impact on loyalty, meaning that a data breach could lead to customer loss. Based on theory and validating interviews, this is approached as an essential component for B2B relationships.

Although the original methodology did not provide for direct effects of perceived risk on satisfaction and trust, the results suggest that examining this relationship from an alternative perspective may be valuable. The lack of a direct effect of perceived risk on trust and satisfaction, while directly affecting loyalty, could indicate a more complex relationship between these variables. It suggests that customer satisfaction may be influenced by other factors not directly related to this variable. These findings highlight the importance of examining additional intervening variables that may clarify and strengthen the relationship between these factors, allowing a deeper understanding of the underlying mechanisms that influence customer loyalty.

5.2 Generalizability

In the context of Business-to-Business (B2B) research, it is important to note that a small sample size does not necessarily come at the expense of generalizability, as long as there are enough unique key informants in the sample (Tang et al., 2020) . In this study, the sample size of 33 unique organizations is sufficient to draw broader conclusions in a B2B context.

The generalizability of the results has certain limitations that must be considered. This study focuses specifically on users of revenue-generating E-commerce software. It is worth noting that when an application is hosted in the cloud, such as a large ERP system or Customer Data platform, it can also be considered revenue-generating software. However, the findings of this study apply primarily to software where you can exercise significant control to align products and services with customer and business objectives.

In addition, it is important to recognize that the sample for this study consisted primarily of people from Scandinavia and Germany. As a result, the generalizability of the results to other countries and cultures may be limited. While usage may not be significantly different in other regions, the applicability of these results is most relevant to e-commerce SaaS providers seeking to measure customer loyalty using the proposed research framework.

6.0 Conclusion

This research concludes that a (B2B) relationship includes both trust and satisfaction, which leads to loyalty. One notable finding is that satisfaction seems to have a slightly greater impact on customer loyalty compared to trust. The stronger relationship between satisfaction and loyalty can be attributed to the immediate and tangible benefits customers experience directly from the software and services provided. Trust, on the other hand, is a quality that develops gradually through consistent performance and positive results. This study is a brand-oriented attitudinal measurement, focusing on the users' cognitive response toward the software features and the provider. The results indicate strong attitudinal loyalty, characterized by high levels of satisfaction and trust.

Second, the research underscores the significant influence of service quality on customer satisfaction in B2B relationships. The Key characteristics of responsiveness, flexibility and reliability contribute significantly to higher customer satisfaction. Moreover, there is a preference for service in the native language and a consistent point of contact, emphasizing the importance of customized service.

Third, Ease of use has a major impact on user satisfaction and perceived usefulness. It is critical to ensure an easy-to-operate system with training opportunities and alignment with business goals. The findings underscore the importance of user-friendly interfaces in increasing overall satisfaction. When users experience greater ease and efficiency in using software, their satisfaction increases.

Fourth, our research reinforces the importance of a user-friendly system for users' perception of its usefulness, consistent with Davis' Technology Acceptance Model (TAM). This robust relationship is fueled by effective training and consulting services, which promote user proficiency and operational efficiency. Ultimately, consistent delivery of value and alignment with customer business objectives lead to the development of trust.

Fifth, we observe no direct effects of perceived usefulness and perceived value on customer satisfaction. This can be attributed to the emphasis of these factors on economic value, while our findings highlight the overriding role of practical functionality for user satisfaction. Nevertheless, perceived usefulness and perceived value remain essential to loyalty and customer economic value. The alignment between SaaS vendors and customer business goals, while not strongly emphasized, may affect productivity to some extent because service quality occasionally fails to meet specific customer needs.

Sixth, trust in B2B relationships is influenced by three main factors: perceived usefulness, service quality and perceived value. In particular, the influence of service quality is determined by reliability and responsiveness of it. In addition, perceived usefulness contributes to the initial establishment of trust, but the development of trust over time is influenced by several factors, including consistent service and alignment with customers' goals. Perceived value, primarily associated with economic value, also plays a crucial role in building trust by emphasizing the importance of what the service delivers.

Last conclusion, our study shows that perceived risk indirectly affects trust and satisfaction with e-commerce software providers. This is due to the assumed credibility of SaaS providers, supported by certifications such as GDPR compliance and data security expertise. Nevertheless, the study highlights the important role of perceived risk in driving customer loyalty and emphasizes its importance, especially in B2B relationships, where a data breach could potentially lead to customer loss.

6.1 Theoretical implications

The existing literature on measuring customer satisfaction, trust and loyalty in SaaS companies is scarce, but even more limited within the specific domain of B2B interactions in e-commerce. Therefore, the contribution of this paper is to shed light on the determinants affecting customer loyalty in the context of e-commerce SaaS companies. From a theoretical perspective, our research recognizes users' attitudes toward technology and highlights the value of trust and satisfaction on E-commerce SaaS software users' loyalty.

Our developed framework extends Alsajjan' (2014) STM model and identifies additional determinants for sustaining B2B SaaS relationships. While existing models such as Benlian et al. (2014) primarily assess customer satisfaction based on service quality and often fail to measure how one perceives the value they gain from the software for their organization and the trust that is built in the process. Consequently, this study critiques the findings of Alsajjan (2014) and Benlian et al. (2014) approaches, with Benlian focusing only on the impact of service quality on satisfaction and omitting trust, and Alsajjan, while measuring trust and satisfaction, largely considering them only in the context of service quality. Further developing a more comprehensive model that includes multiple determinants would allow for a more accurate and robust representation of SaaS B2B relationships. However, the current conceptual model is moderate and primarily emphasizes the importance of trust and satisfaction in determining loyalty, which is consistent with existing research (Alsajjan, 2014). However, the association between perceived value, perceived usefulness and satisfaction needs further investigation because the findings are inconclusive. Examining the effect of perceived risk, considering the perceived credibility of SaaS providers regarding data security, would also add value. Based on the direct effects of factors on loyalty observed in this study and supported by previous theories, it is recommended that a comprehensive model be developed that includes both direct and intermediate effects (with trust and satisfaction) on loyalty along with relevant external factors. In this model, loyalty should also be measured on two dimensions, attitudinal and behavioral. Here, a more flexible model that is not so strictly structured and can include a wide range of variables to understand the relationships between the constructs such as that of Mishra' et al. (2023) is advocated. Further extension of this model is therefore recommended.

Moreover, a significant portion of contemporary IS research relies on established models such as Davis' (1989) TAM and Bhattacherjee' (2001) Expectancy Confirmation Theory to assess the factors that shape behavioral intentions, a practice that is evident in Mishra' et al. (2023) research. Although that model traditionally overlooks the role of service quality, both our study and Mishra's research highlight the potential for behavioral intentions to be enriched by including additional factors.

6.2 Practical implications

The results of this study provide valuable practical insights for FactFinder and the broader SaaS B2B industry. This knowledge can enable SaaS providers to strategically improve their e-commerce applications, increasing customer satisfaction, trust, and loyalty. These improvements translate directly into better e-commerce services and greater business success.

Developing and maintaining a user-friendly system is crucial to increasing user satisfaction and productivity, which ultimately promotes satisfaction and trust in the SaaS vendor. However, this ease of use must be complemented by consistent service quality. Achieving this requires a high level of responsiveness and reliability, where it is important that customers interact with dedicated consultants who thoroughly understand the customer's business objectives. This approach not only builds trust but also enables effective problem solving and problem resolution. While staff training and knowledge are important, much could be taken out of staff's hands by documentation. Using videos and structured content can ensure that people find the system easy to use over time.

While most IS research focuses primarily on the ultimate outcomes of success or failure, intermediate assessments, such as those in this study, play an important role in customer retention and acquisition. Trust is a subjective trait and varies between individuals. Therefore, managers should prioritize strategies that increase user trust. These strategies can include addressing privacy and security concerns and developing a reliable and user-friendly system that produces the desired results, combined with expert guidance from competent consultants.

Users' perceptions of usefulness and value significantly influence their trust and provide marketers with a valuable opportunity to refine their communication strategies. To maximize trust and satisfaction, marketers must communicate the benefits of technology concisely. Many companies currently use vague messages promising all-encompassing solutions. This may attract early users, but over time leads to user discomfort and reduced trust. As a result, users may share negative experiences and discourage others from using the technology. To mitigate this, marketers must develop communication strategies that align the perceived benefits with the actual capabilities of the technology.

6.3 Limitations

Some limitations occur during the research process. These stem from choices made during the research process or unforeseen circumstances that were beyond the control of the study. A primary limitation in this study was the absence of existing literature that directly addressed the assessment of relationships and service quality within SaaS companies providing e-commerce software. Given the significant impact of e-commerce software on revenue, this gap was particularly noteworthy. To fill this gap, validated methods and tools from unrelated contexts were adapted for use. Consequently, during the design phase of the study, certain assumptions had to be made about the expected results, using the quality standards observed in B2B relationships and assessments of service quality from different domains.

Second, as shown in previous literature, there are many other factors that influence customer satisfaction, trust and continuous intention, such as Attitude, performance, social influences competition, etc. Our model explains 68%, 62%, and 68,5% of the variance in satisfaction, trust, and loyalty, respectively. Although the explanatory power is already quite good compared to other similar studies, research on other factors could improve the model.

Lastly related to the context of the study, the results were tested with an on-site search provider where survey responses were mainly from German and Scandinavian respondents given the customer base. Furthermore, there exists a participation bias, as a significant portion of the survey participants consisted of long-term users of the software. This suggests that they may hold a more favorable view of e-commerce software compared to those who have recently started using it, potentially impacting the research outcomes.

6.4 Future research

Several possibilities for further research emerged from this study. First, this research focused on specific SaaS contexts, but it would be valuable to apply the same methodology across different SaaS environments. This could identify a broader range of factors that affect B2B relationships and increase our understanding of these relationships. This could also help determine whether the findings are consistent across different contexts.

Another opportunity for future research is to expand the variables that could influence the quality and loyalty of B2B relationships. For example, the variable Perceived Ease of Use (PEOU) can be further broken down into different components to get a more holistic picture of how users perceive the usability of SaaS systems. In addition, an exploration of the impact of potential data breaches on trust and satisfaction is essential for designing comprehensive risk management strategies and maintaining customer loyalty. This research would contribute to a more holistic understanding of the diverse nature of customer relationships and their impact on loyalty in the SaaS context. This can help us identify specific aspects that can be improved to increase the quality of relationships. In addition, we recommend adding additional variables in a subsequent study to determine even more accurately what contributes to loyalty. These are mainly the external variables over which the SaaS provider has little to no influence. Think of attitude, competition, and brand awareness.

Future research in this context measuring different variables on loyalty should be more focused on flexible models rather than strictly structured ones. Aimed at exploring the connections and relationships between these variables, leading to a more comprehensive understanding of customer loyalty within the context of this study. In which it is also important that loyalty is measured based on the two dimensions prescribed by the marketing literature.

7.0 Bibliography

Abu-Salim, T., Onyia, O. P., Harrison, T. S., Lindsay, V. J., & Salim, T. (2017). Effects of Perceived Cost, Service Quality, and Customer Satisfaction on Health Insurance Service Continuance. *The Journal of Neuroscience and Neuro-Engineering*, *22*(4), 173–186.

Al-Haraizah, A., & Al-Nady, B. (2015). *E-loyalty and Business to Business (B2B) E-Commerce Success: Applied Study on Sample of E-Retailers in Amman City*. https://doi.org/10.3844/ajebasp.2015.112.121

Alsajjan, B. A. (2014). *Satisfaction-Trust Model: Developing Customer Satisfaction and Trust Indices for Mobile Service Providers in the UK*. www.irmbrjournal.com

Baumann, E., Kern, J., & Lessmann, S. (2022). Usage Continuance in Software-as-a-Service. *Information Systems Frontiers*, *24*(1), 149–176. https://doi.org/10.1007/S10796-020-10065-W/FIGURES/27

Benitez, J., Henseler, J., Castillo, A., & Schuberth, F. (2020). How to perform and report an impactful analysis using partial least squares: Guidelines for confirmatory and explanatory IS research. *Information & Management*, *57*(2), 103168. https://doi.org/10.1016/J.IM.2019.05.003

Benlian, A., Koufaris, M., & Hess, T. (2010). THE ROLE OF SAAS SERVICE QUALITY FOR CONTINUED SAAS USE: EMPIRICAL INSIGHTS FROM SAAS USING FIRMS. *ICIS 2010 Proceedings*. https://aisel.aisnet.org/icis2010_submissions/26

Benlian, A., Koufaris, M., & Hess, T. (2014). Service Quality in Software-as-a-Service: Developing the SaaS-Qual Measure and Examining Its Role in Usage Continuance. *Https://Doi-Org.Ezproxy2.Utwente.Nl/10.2753/MIS0742-1222280303*, *28*(3), 85–126. https://doi.org/10.2753/MIS0742-1222280303

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly: Management Information Systems*, *25*(3), 351–370. https://doi.org/10.2307/3250921

Boksberger, P. E., & Melsen, L. (2011). Perceived value: A critical examination of definitions, concepts and measures for the service industry. *Journal of Services Marketing*, *25*(3), 229–240. https://doi.org/10.1108/08876041111129209

Butt, U. A., Amin, R., Mehmood, M., Aldabbas, H., Alharbi, M. T., & Albaqami, N. (2023). Cloud Security Threats and Solutions: A Survey. *Wireless Personal Communications*, *128*(1), 387–413. https://doi.org/10.1007/S11277-022-09960-Z/FIGURES/6

Caceres, R. C., & Paparoidamis, N. G. (n.d.). *Service quality, relationship satisfaction, trust, commitment and business-to-business loyalty*. https://doi.org/10.1108/03090560710752429

Chen, S. C., & Dhillon, G. S. (2003). Interpreting Dimensions of Consumer Trust in E-Commerce. *Information Technology and Management 2003 4:2*, *4*(2), 303–318. https://doi.org/10.1023/A:1022962631249

Chestnut ; Of Jacoby, R. W., Chestnut, ; J, & Chestnut, R. W. (1978). Brand loyalty : measurement and management /. In *Fremdsprachige A Review of Brand-Loyalty Measures in Marketing-Lirias Brand Loyalty: Measurement and Management. Management: Vol. XLI* (Issue 3). Wiley,.

Cho, V., & Chan, A. (2015). An integrative framework of comparing SaaS adoption for core and non-core business operations: An empirical study on Hong Kong industries. *Information Systems Frontiers*, *17*(3), 629–644. https://doi.org/10.1007/S10796-013-9450-9/TABLES/10

Chou, S. W., & Chiang, C. H. (2013). Understanding the formation of software-as-a-service (SaaS) satisfaction from the perspective of service quality. *Decision Support Systems*, *56*(1), 148–155. https://doi.org/10.1016/J.DSS.2013.05.013

Chou, T. H. (2019). Exploring relationship quality of user's cloud service: The case study of SaaS CRM. *Journal of Organizational and End User Computing*, *31*(3), 17–36. https://doi.org/10.4018/JOEUC.2019070102

Crosby, L. A., Evans, K. R., & Cowles, D. (1990). Relationship Quality in Services Selling: An Interpersonal Influence Perspective. *Journal of Marketing*, *54*(3), 68. https://doi.org/10.2307/1251817

Daikeler, J., & Bo, M. (2020). WEB VERSUS OTHER SURVEY MODES: AN UPDATED AND EXTENDED META-ANALYSIS COMPARING RESPONSE RATES. *Journal of Survey Statistics and Methodology*, *8*, 513–539. https://doi.org/10.1093/jssam/smz008

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339. https://doi.org/10.2307/249008

Du, J., Lu, J., Wu, X., & Li, J. (2012). *Research on the Influential Factors of SaaS User Acceptance*. https://doi.org/10.1109/ISMOT.2012.6679454

Duncan, E., & Elliott, G. (2002). Customer service quality and financial performance among Australian retail financial institutions. *Journal of Financial Services Marketing 2002 7:1*, *7*(1), 25–41. https://doi.org/10.1057/PALGRAVE.FSM.4770070

Eid, M. I. (2011). *Eid: Determinants of E-Commerce Customer Satisfaction, Trust, and Loyalty in Saudi Arabia DETERMINANTS OF E-COMMERCE CUSTOMER SATISFACTION, TRUST, AND LOYALTY IN SAUDI ARABIA*.

Evans, J. R., & Mathur, A. (2018). The value of online surveys: a look back and a look ahead. *Internet Research*, *28*(4), 854–887. https://doi.org/10.1108/INTR-03-2018-0089/FULL/XML

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39. https://doi.org/10.2307/3151312

Freitas, A. L. P., & Neto, M. M. F. (2017). Assessing the service quality in Software-as-a-Service from the customers' perspective: a methodological approach and case of use. *Production*, *27*, e20170020. https://doi.org/10.1590/0103-6513.20170020

Heart, T. (2010). Who Is out There? Exploring the Effects of Trust and Perceived Risk on SaaS Adoption Intentions. *SSRN Electronic Journal*. https://doi.org/10.2139/SSRN.2895421

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., & Calantone, R. J. (2014). Common Beliefs and Reality About PLS: Comments on Rönkkö and Evermann (2013). *Organizational Research Methods*, *17*(2), 182–209. https://doi.org/10.1177/1094428114526928

Hussein, L. A., Suhaimi Baharudin, A., Jayaraman, K., & Kiumarsi, S. (2019). B2B E-COMMERCE TECHNOLOGY FACTORS WITH MEDIATING EFFECT PERCEIVED USEFULNESS IN JORDANIAN MANUFACTURING SMES. *Journal of Engineering Science and Technology*, *14*(1), 411–429.

Jugenheimer, D. W. (1979). Brand Loyalty, Measurement and Management. Jacoby, Jacob, and Robert W. Chestnut. New York: John Wiley & Sons, 1978. 120 pp. *Journal of Advertising*, *8*(2), 46–46. https://doi.org/10.1080/00913367.1979.10717981

Kesuma, T. M., Yunus, M., Siregar, M. R., & Muzammil, A. (2021). Quality and image: The role of satisfaction and trust as intervening variables on loyalty of customer's internet service providers. *Jurnal Manajemen Dan Pemasaran Jasa*, *14*(2), 282. https://www.academia.edu/70777212/Quality_and_image_The_role_of_satisfaction_and_trust_as_intervening_variables_on_loyalty_of_customer_s_internet_service_providers

Kim, D. J., Ferrin, D. L., & Raghav Rao, H. (2009). Trust and satisfaction, two stepping stones for successful e-commerce relationships: A longitudinal exploration. *Information Systems Research*, *20*(2), 237–257. https://doi.org/10.1287/ISRE.1080.0188

Larzelere, R. E., & Huston, T. L. (1980). The Dyadic Trust Scale: Toward Understanding Interpersonal Trust in Close Relationships. *Journal of Marriage and the Family*, *42*(3), 595. https://doi.org/10.2307/351903

Legris, P., Ingham, J., & Collerette, P. (n.d.). *Why do people use information technology? A critical review of the technology acceptance model*.

Mellens, M., Dekimpe, M. G., & Steenkamp, J. E. B. M. (1996). A review of brand loyalty measures in marketing. *Tijdschrift Voor Economie En Management*, *XLI*(4), 507–533. https://research.tilburguniversity.edu/en/publications/a-review-of-brand-loyalty-measures-in-marketing

Mishra, A., Shukla, A., Rana, N. P., Currie, W. L., & Dwivedi, Y. K. (2023). Re-examining post-acceptance model of information systems continuance: A revised theoretical model using MASEM approach. *International Journal of Information Management*, *68*, 102571. https://doi.org/10.1016/J.IJINFOMGT.2022.102571

Olde Klieverik, R. (2023). *MEASURING CUSTOMER SATISFACTION AT A SAAS PROVIDER: A B2B PERSPECTIVE*.

Oliver, R. L. (1976). Effect of expectation and disconfirmation on postexposure product evaluations: An alternative interpretation. *Journal of Applied Psychology*, *62*(4), 480–486. https://doi.org/10.1037/0021-9010.62.4.480

Ozdemir, E., & Sonmezay, M. (n.d.). *The Effect of The E-Commerce Companies' Benevolence, Integrity and Competence Characteristics on Consumers' Perceived Trust, Purchase Intention and Attitudinal Loyalty*. https://doi.org/10.20409/berj.2020.283

Pumim, A., Srinuan, C., & Panjakajornsak, V. (2017). Mobile Phone Customer Loyalty in Thailand: A Path Analysis Case Study. *Asia-Pacific Social Science Review*.

Rahman, A. (2022). *Software as a Service (SaaS) Adoption Factors: Individual and Organizational Perspective*. https://doi.org/10.1109/ICITE54466.2022.9759891

Rauyruen, P., & Miller, K. E. (2007). Relationship quality as a predictor of B2B customer loyalty. *Journal of Business Research*, *60*(1), 21–31. https://doi.org/10.1016/J.JBUSRES.2005.11.006

Seifert, M., Kuehnel, S., & Sackmann, S. (2023). Hybrid Clouds Arising from Software as a Service Adoption: Challenges, Solutions, and Future Research Directions. *ACM Computing Surveys*, *55*(11). https://doi.org/10.1145/3570156

Seong Tak, O., & Park, S. (2018). Investigating SaaS Providers' market success based on the Multivariate LGCM Approach. *Procedia Computer Science*, *139*, 227–235. https://doi.org/10.1016/J.PROCS.2018.10.255

Setó-Pamies, D. (2012). Customer loyalty to service providers: examining the role of service quality, customer satisfaction and trust. *Https://Doi.Org/10.1080/14783363.2012.669551*, *23*(11–12), 1257–1271. https://doi.org/10.1080/14783363.2012.669551

Shaheen, F., Ahmad, N., Waqas, M., Waheed, A., & Farooq, O. (2017). Structural Equation Modeling (SEM) in Social Sciences & Medical Research: A Guide for Improved Analysis. *International Journal of Academic Research in Business and Social Sciences*, *7*(5). https://doi.org/10.6007/IJARBSS/V7-I5/2882

Shil, N. C., Ali, M. A., & Rabbani Paiker, N. (2010). Robust customer satisfaction model using QFD. *International Journal of Productivity and Quality Management*, *6*(1), 112–136. https://doi.org/10.1504/IJPQM.2010.033887

Sing, A., Taneja, A., & Mangalaraj, G. (2009). Creating online surveys: Some wisdom from the trenches tutorial. *IEEE Transactions on Professional Communication*, *52*(2), 197–212. https://doi.org/10.1109/TPC.2009.2017986

Statista. (2022). *Europe B2B e-commerce GMV forecast 2025 | Statista*. https://www.statista.com/forecasts/1300515/business-to-business-online-market-value-forecast-europe

Statista. (2023, August 29). *E-commerce revenue in Germany 2023 | Statista*. https://www.statista.com/statistics/454371/e-commerce-revenue-germany/

Tam, J. L. M. (2004). Customer Satisfaction, Service Quality and Perceived Value: An Integrative Model. *Journal of Marketing Management*, *20*, 897–917. https://doi.org/10.1362/0267257041838719

Tang, T., Fang, E., & Qualls, W. J. (2020). Commitment and Replacement of Existing SaaS-delivered Applications: A Mixed-methods Investigation. *MIS Quarterly*, *44*(4), 1811–1857. https://doi.org/10.25300/MISQ/2020/13216

Venkatesh, V., & Davis, F. D. (2000). Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science*, *46*(2), 186–204. https://doi.org/10.1287/MNSC.46.2.186.11926

Wolfswinkel, J. F., Furtmueller, E., & Wilderom, C. P. M. (2013). Using grounded theory as a method for rigorously reviewing literature. *European Journal of Information Systems*, *22*(1), 45–55. https://doi.org/10.1057/EJIS.2011.51

Yang, Z., & Peterson, R. T. (2004). Customer perceived value, satisfaction, and loyalty: The role of switching costs. *Psychology and Marketing*, *21*(10), 799–822. https://doi.org/10.1002/MAR.20030

Zeithaml, V. A. (1988). Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, *52*(3), 2–22. https://doi.org/10.1177/002224298805200302

Appendencis

Appendix A - Systematic literature review

Each step will be elaborated in detail to give the clearest possible picture of how the information was retrieved from the theoretical framework. This ensures transparency and logic of the steps taken during the SLR. First, each step will be briefly explained, then (in most cases via a table or flow form) the implications for the data to be used during the research will be described.

Number	Task
1. DEFINE	
1.1	Define the criteria for inclusion/exclusion
1.2	Identify the fields of research
1.3	Determine the appropriate sources
1.4	Decide on the specific search terms
2. SEARCH	
2.1	Search
3. SELECT	
3.1	Refine the sample
4. ANALYZE	
4.1	Open coding
4.2	Axial coding
4.3	Selective coding
5. PRESENT	
5.1	Represent and structure the content
5.2	Structure the article

Figure 4: Steps for grounded theory systematic literature review

1.0 Define

Based on the study of Wolfswinkel (2013) the define step is described in four substeps. The inclusion/exclusion step involves defining criteria to determine which articles will be included or excluded from the SLR This includes setting criteria for publication outlets, time frames, and other factors that are not related to the research topic, and it may need to be revisited later in the review process. In the second sub-step, the appropriate research areas must be identified. These areas can be broad or narrow, depending on the nature of the topic. For interdisciplinary reviews, which is the case in this study, the researcher should ideally be familiar with the various fields. To efficiently locate the desired texts in the selected area(s), the next sub-step involves choosing appropriate outlets and databases. This involves compiling a list of possible sources based on the filtering power of the inclusion and exclusion criteria and the research area(s) involved. The last sub step, the focus is on defining precise search terms, which is crucial for identifying relevant outlets and databases. It is important to use search terms that accurately reflect the entire scope of the research area. Different outlets and databases offer different search functionalities, such as keyword searches in titles and abstracts or searching through subsets of text. To ensure transparency, all search terms should be listed in the review article.

Review methodology

Sub-step	Translation to this research
1.1 Inclusion criteria	• Empirical studies • Online shop* • B2B studies • Publications involving customer satisfaction,trust, and loyalty tools
1.1 Exclusion criteria	• Papers that are not in English • Papers that are not accessible • Books • E-commerce related paper published before 2005 except articles that form the foundation.
1.2 Identify fields of research	• Business and Management • Information Systems • Information Technology and Management • Social Science
1.3 Determine appropriate sources	• Scopus, ScienceDirect, and Google Scholar • IEEE journal • Journal of Management Information Systems • Psychology and Behavioral Sciences Collection (EBSCO) • References from sources found within IEEE and Sagehup
1.4 The specific search terms	SaaS AND Continuance AND (b2b relationships).

Table 13: Specific choices for defining the SLR.

For some of the choices about review methodology, it might be wise to give an explanation in more detail.

1.1 Define criteria for inclusion and exclusion

In regard to the exclusion criteria, Books: This criterion excludes books from the review. This is because books may not be as focused on empirical research as journal articles or conference proceedings, which are the primary sources of empirical research on the topic of e-commerce in B2B relationships. While books can provide valuable insights and perspectives, they are generally considered secondary sources and may not provide as much rigor and depth as primary sources. SaaS and E-commerce related papers published before 2000: This criterion excludes papers published before 2000 on the topic of e-commerce in B2B relationships. The reason for using papers from a decade ago is because papers were published from 2000 to 2010 that focused mostly on customer engagement. SaaS and E-commerce related papers were retrieved from 2011.

1.2 identify the fields of research

Due to the diverse scope of this research, it can be categorized into various fields of study. These include Business and Management, as the topics explored are closely tied to e-commerce businesses and their managerial actions. Information Systems is another relevant field, focusing on SaaS solutions and their impact on revenue generation. Within the realm of Psychology, the study examines customer satisfaction, with a narrower focus on Customer Relationship Management (CRM). Additionally, Computer Science can be considered as a related field, although with less emphasis on the technical aspects of SaaS solution design. Social science research: This field of research encompasses a broad range of disciplines, including sociology, psychology, economics, political science, and anthropology. It involves the study of human behavior and social interactions, as well as the analysis of social structures and institutions. In the context of e-commerce, social science research can help shed light on the factors that affect consumer behavior, as well as the social and cultural factors that shape the adoption and use of e-commerce platforms.

1.3 Determine appropriate sources

For identifying relevant publications, several suitable sources can be utilized. General databases like Scopus, ScienceDirect, Google Scholar, and SpringerLink are recommended as they provide comprehensive coverage across various disciplines. Additionally, specific sources aligned with the fields of research mentioned in section 1.2 can be explored:

- IEEE Xplore journal, for scientific and technical publications.
- Information Science & Technology Abstracts (EBSCO), for literature about SaaS and e-commerce
- Journal of Management Information Systems, for specific literature about information systems.
- Psychology and Behavioral Sciences Collection (EBSCO), for literature about behaviors of service users and customer satisfaction, trust, and loyalty.

1.4 Decide on the specific search terms

During the Decide phase, the focus is on generating search terms and combinations that are pertinent to the fields of research, and in some instances, to more specific topics. These search terms can yield diverse outcomes depending on the database used, as they are tailored to align with a particular database's search functionalities. While several search terms and combinations were employed, the following search string resulted in the discovery of the most relevant articles.

Database	Search terms	#Articles	Relevant Articles
Scopus	SaaS AND Continuance	17	5
Scholar	SaaS AND Continuance AND (b2b relationships)	308	3

Table 13: search terms in different databases

The reason the terms were chosen regarding SaaS is because in recent similar research by Olde Klieverik (2023) the same search terms were used and delivered the best result for a validated SLR.

When searching with the search terms SaaS and Continuance, it was found that Loyalty was not mentioned very often. It was also found that studies often refer to studies conducted within the service industry. As a result, an additional search was conducted using the following two search terms. We searched in Scopus from 2009 and in Scholar from 2020 to the present, given the rapidly changing industries in which service providers operate.

Database	Search terms	# Articles	# Relevant Articles
Scopus	Loyalty AND Service provider AND B2B OR Business to Business	8	1
Scholar	Service providers AND Loyalty	17	2

Table 14: search terms in different databases

Section 3.1 names the additional articles retrieved through backtracking within the systematic literature search.

2.0 Search

During the search phase, the keywords identified in section 1.4 were employed in the chosen database, which in this case was Scopus, as it provided the most precise selection of relevant articles. After entering the specific search terms in various databases, 11 relevant studies emerged as described in tables 2.1 and 2.2. Wolfswinkel et al. (2013) prescribe that articles can be added to the SLR list via back-and-forward tracking. Six more relevant studies emerged here resulting in a list of 17 relevant articles for this study. The identified relevant articles were then further explored by conducting backward and forward tracking. This involved examining the references of the selected articles as well as determining if any subsequent articles cited the initial ones, thereby ensuring a comprehensive review of the literature.

Article	Author	Title	Journal	Year	Source
1	Benlian A, Koufaris M, Hess T	The role of SaaS service quality for continued SaaS use: empirical insights from SaaS using firms.	International conference on information systems	2014	Obtained via systematic literature review
2	Bhattacherjee A,	Understanding information systems continuance: an expectation-conformation model	Journal of management information systems.	2001	Obtained via systematic literature review and foundation of several sources
3	Eid M	Determinants of e-commerce customer satisfaction, trust, and loyalty in Saudi Arabia: determinants of e-commerce customer satisfaction, trust, and loyalty in Saudi Arabia.	Journal of Electronic Commerce Research	2011	Obtained via systematic literature review
4	Benlian A, Koufaris M, Hess T	Service Quality in Software-as-a-Service: Developing the SaaS-Qual Measure and Examining Its Role in Usage Continuance	Journal of management information systems	2011	Obtained via systematic literature review
5	Chou S, Chiang C	Understanding the formation of software-as-a-service (SaaS) satisfaction from the perspective of service quality	International Journal of Technology and Management	2013	Obtained via systematic literature review
6	Freitas A, Neto M	Assessing the service quality in Software-as-a-Service from the customers' perspective: a methodological approach and case of use	Production	2017	Back tracked tracked via Benlian A. (2014)
7	Heart T	Who Is out There? Exploring the Effects of Trust and Perceived Risk on SaaS Adoption Intentions	SSRN Electronic Journal	2010	Forward tracked from Cho and Chan (2015)
8	Zeithaml V	Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence	Journal of Marketing	1988	Obtained via systematic literature review and foundation of several sources
9	Tam J	Customer Satisfaction, Service Quality and Perceived Value: An Integrative Model	Journal of marketing management	2004	Backward tracked from Zeithmal V (1988)
10	Cho V, Chan A	An integrative framework of comparing SaaS adoption for core and non-core business operations: An empirical study on Hong Kong industries	Information Systems Frontiers	2015	Obtained via systematic literature review
11	Baumann E, Kern J, Lessmann S	Usage Continuance in Software-as-a-Service	Information Systems Frontiers	2022	Obtained via systematic literature review
12	Boksberger and Melsen.	Perceived value: A critical examination of definitions, concepts and measures for the service industry.	Journal of Services Marketing	2011	Backward from Tam,j (2004)
13	Chen S, Dhillon G	Interpreting Dimensions of Consumer Trust in E-Commerce	Information Technology and Management	2003	Foward tracked from Chou and Chiang (2013)
14	Mishra et al.	Re-examining post-acceptance model of information systems continuance: A revised theoretical model using MASEM approach	International Journal of Information Management	2023	Obtained via systematic literature review
15	Liu X, Prybutok V	An empirical investigation of factors that drive a user decision to continue using cloud storage services.	Journal of Decision Systems	2021	Obtained via systematic literature review
16	Alsajjan B	Satisfaction-Trust Model: Developing Customer Satisfaction and Trust Indices for Mobile Service Providers in the UK	International Review of Management and Business Research	2014	Forward racked via T.M. Kesuma (2021)
17	T. M. Kesuma, Mukhlis Yunus, M. Siregar, A. Muzammil	Quality and image: The role of satisfaction and trust as intervening variables on loyalty of customer's internet service providers	Journal of Service Management and Marketing	2022	Obtained via systematic literature review

Table 15: Main sources from systematic literature review

3.0 Select

In the third stage, the items are joined into a sample. Wolfswinkel (2013) created a graphic for this that can be seen in appendix 1. First, the articles that are duplicates or do not meet the criteria described in Step 1 are filtered out. To further ensure quality, forward and backward citations must be considered, which means looking at articles that are used in this study but are a reference from the studies in the sample. For these studies, stage three should be performed again.

4.0 Analyze

The article of Wolfswinkel (2013)discusses how to apply the principles of Grounded Theory in the fourth stage of a literature review. Instead of using documentary evidence, Grounded Theory is used to analyze published papers. As described in stage 3 the papers are carefully selected to represent the best available knowledge of a niche or area in which the literature review is performed. The review engages in open coding, axial coding, and selective coding to analyze each set of papers systematically. Open coding involves re-reading excerpts from the studies and identifying concepts and meta-insights that represent the data in a niche, based on the review question(s) posed. Categories are then identified, which capture groups of concepts, and these categories can have properties that determine the differences between them. Ultimately, the goal of open coding is to isolate a set of constructs from a set of excerpts that pertain to the empirical findings themselves. Axial coding involves relating categories to each other, while selective coding involves choosing a core category and relating it to other categories to form a theoretical framework.

5.0 Present

Through this literature review, essentially findings will be presented textually in the theoretical framework. Although Wolfswinkel (2013) describes how findings should be presented in relation to grounded theory, he indicates the following regarding presenting findings: ''*A solid representation of the accumulated empirical facts is of course to be included, for those readers of the literature review who would simply want an overview of the topic, niche or area*''. That is also the purpose of this theoretical framework, one to give a clear picture of the data and information that is already known about Ecommerce within B2B and to show that this research can complement it.

While the first three stages of the literature review are very useful for this study, the stage of analysis is less so. As described, stage four requires an extensive coding process to properly interpret and present the data, ultimately resulting in a grounded theory. Since the research question of this study is already largely defined and focuses on identifying the most important factors, the analysis process is simplified. This research aims to find the relationships between the most important factors and not to develop new theories directly. The first three and last stages of the literature review are conducted in the prescribed manner. For analyzing the information, there will not be an extensive coding process; instead, similar studies that have already identified factors that have a significant effect on trust and loyalty will be examined. Given that not all factors will have been measured, an open coding process will be held to investigate if there are significant results and findings that can be categorized into possible additional factors.

Appendix B - Panel of experts

Customer Success Managers: Customer success managers are responsible for customer satisfaction and building strong relationships with customers. Their role includes understanding customer needs, monitoring the customer experience and driving metrics for customer success. Their expertise can provide valuable insights into measuring the quality of service and relationships from the customer's perspective. They can provide insight into customer expectations, pain points and factors that contribute to trust and satisfaction in B2B e-commerce SaaS relationships.

Program information manager: A Program Information Manager in a SaaS company plays a central role in managing information and programs. They coordinate projects, manage data and analyze it to gain insights. The Program Information Manager effectively communicates between different teams and departments and ensures collaboration. They report progress and results to management and manage risks that may affect programs. They also ensure compliance with laws, regulations, and internal policies. The Program Information Manager is crucial for efficiently managing information and programs, which contributes to the success of the SaaS business. This made it very useful for assessing the survey and complying with all GDPR regulations. Additionally, the Program Information Manager played a role in translating the survey from English to German

Appendix C - Survey questions/items

ID	Abbr.	Survey item	Variable
0.1	Inds	What is the industry type of your organization?	Basic information
0.2	Posn	What is your current position within the firm?	
0.3	Rev	What is the annual revenue of your organization?	
0.4	Emp	How many employees does your organization have?	
0.5	Usag	How long has it been since you implemented Fact-Finder within your organization?	
1	SQ1	**To what extend do you agree with the following statements: Fact-Finder…**Provides a shared approach to problem solving.	Service quality
2	SQ2	Understands our business goals and processes	
3	SQ3	Has an aligned working style (e.g. convenient operating hours)	
4	SQ4	Has the knowledge to answer our questions and helps us solve problems	
5	SQ5	Instills confidence in customers	
6	SQ6	**Fact- Finder has the ability to…:** Improve the integration and interoperability of the SaaS application with our information and communication technology infrastructure	
7	SQ7	Perform modularity of features (or packaging choices)	
8	SQ8	Access to the latest version of the IS applications	
9	SQ9	Flexibly modify contractual parameters, choose the way of payment and billing, provide application customization (i.e. configurability)	
10	PU1	Using Fact-Finder enhances our effectiveness in managing our functions/processes.	Perceived usefulness
11	PU2	Using Fact-Finder enhances our productivity in managing our functions/processes.	
12	PU3	Using Fact- Finder improves our performance in managing our functions/processes.	
13	PEOU1	**Do you agree with the following statements…:** The backend/user interface of Fact-Finder is easy to use	Perceived ease of use
14	PEOU2	It was easy for us (yourself or colleagues) to become skillful at using FactFinder.	
15	PEOU3	Our interaction with FactFinder is clear and understandable (system wise).	
16	PEOU4	We find it easy to get FactFinder to do what I want it to do (system wise).	
17	PV1	**Do you agree with the following statements…:** To what extent do you believe that Fact-Finder contributes to the profitability of your e-commerce business?	Perceived value
18	PV2	The benefits of Fact-Finder SaaS are greater than its cost?	
19	PV3	Comparing what I pay to what I might get from other competitive companies, I think the company provided me with good value?	
20	PV4	Do you agree that FactFinder provides unique and valuable advantages over competing solutions?	
21	PR1	**Do you agree with the following statements…:** Do you believe that the security of Fact-Finder can impact the success and reputation of your business's e-commerce operations?	Perceived risk
22	PR2	I believe that Fact-Finder only collects the necessary personal data for its activities?	
23	PR3	I feel safe when sending personal (organization) information to Fact-Finder?	
24	TRU1	**Do you agree with the following statements…:** The Fact-Finder administrators demonstrate care not only for themselves but also for my satisfaction.	Trust
25	TRU2	Overall, the web Fact-Finder employees are capable and proficient.	
26	TRU3	The Fact-Finder employees are competent and effective.	
27	TRU4	I perceive the Fact-Finder employees as trustworthy and reliable in their interactions with me.	
28	TRU5	I found Fact-Finder reliable.	
29	TRU6	I value the reliable features of Fact-Finder.	
30	SAT1	**Do you agree with the following statements…:** Overall I am satisfied with Fact-Finder	Satisfaction
31	SAT2	The performance of Fact-Finder site meets my expectations.	
32	SAT3	The overall quality of the service provided by Fact-Finder is Excellent	
33	LOY1	**Do you agree with the following statements…:** I do recommend that others use Fact-Finder.	Loyalty
34	LOY2	My preference for Fact-Finder would not willingly change.	
35	LOY3	I intend to continue using Fact-Finder as our on-site search-provider.	

Appendix D – Unique companies

Branche	Title	Revenue	Employees	Implementation ti	Unique	Not uninque
Home Appliances, Furniture, Décor	Ecommerce manager	> €5.000.000	> 500	5 - 10 years	x	
Home Appliances, Furniture, Décor	Ecommerce manager	> €5.000.000	> 500	3 - 5 years	x	
Home Appliances, Furniture, Décor	Markering manager	€2.500.000 - €5.000.0	50 - 99	1 - 3 years	x	
Home Appliances, Furniture, Décor	Markering manager	€2.500.000 - €5.000.0	100 - 249	3 - 5 years	x	
Home Appliances, Furniture, Décor	Markering manager	€2.500.000 - €5.000.0	100 - 249	1 - 3 years	x	
B2B Versandhandel	Ecommerce manager	> €5.000.000	> 500	Longer than 10 years	x	
Logistics	Ecommerce manager	> €5.000.000	> 500	5 - 10 years	x	
Logistics	Markering manager	> €5.000.000	> 500	5 - 10 years		x
Logistics	Markering manager	> €5.000.000	> 500	5 - 10 years		x
Logistics	Product owner	> €5.000.000	> 500	5 - 10 years		x
Verlag	Markering manager	> €5.000.000	> 500	5 - 10 years	x	
DIY, Gardering	Ecommerce manager	> €5.000.000	> 500	3 - 5 years	x	
DIY, Gardering	Product owner	€2.500.000 - €5.000.0	100 - 249	3 - 5 years	x	
DIY, Gardering	ICT manager	> €5.000.000	250 - 500	5 - 10 years	x	
Pet, Animal Supplies	Product owner	> €5.000.000	> 500	3 - 5 years	x	
Hobbies, Sporting goods	Ecommerce manager	> €5.000.000	50 - 99	1 - 3 years	x	
Hobbies, Sporting goods	ICT manager	€2.500.000 - €5.000.0	250 - 500	5 - 10 years	x	
Hobbies, Sporting goods	Markering manager	> €5.000.000	> 500	Longer than 10 years	x	
Hobbies, Sporting goods	Markering manager	> €5.000.000	50 - 99	1 - 3 years		x
Department store, Wholesale	Ecommerce manager	> €5.000.000	> 500	1 - 3 years	x	
Department store, Wholesale	Ecommerce manager	> €5.000.000	> 500	3 - 5 years	x	
Department store, Wholesale	Ecommerce manager	> €5.000.000	> 500	1 - 3 years	x	
Department store, Wholesale	Product owner	> €5.000.000	> 500	1 - 3 years		x
Department store, Wholesale	Product owner	> €5.000.000	100 - 249	5 - 10 years	x	
Department store, Wholesale	Markering manager	> €5.000.000	> 500	5 - 10 years	x	
Clothes, Shoes, Accessoires	Ecommerce manager	€2.500.000 - €5.000.0	50 - 99	1 - 3 years	x	
Clothes, Shoes, Accessoires	Product owner	> €5.000.000	> 500	Less than 1 year	x	
Clothes, Shoes, Accessoires		> €5.000.000	> 500	Less than 1 year		x
Foodretail	Ecommerce manager	> €5.000.000	> 500	3 - 5 years	x	
Foodretail	Markering manager	> €5.000.000	> 500	1 - 3 years	x	
Foodretail	Product owner	> €5.000.000	> 500	1 - 3 years	x	
Foodretail	Product owner	€2.500.000 - €5.000.0	> 500	5 - 10 years	x	
Foodretail	Product owner	> €5.000.000	> 500	1 - 3 years		x
Foodretail	Product owner	> €5.000.000	> 500	1 - 3 years		x
Foodretail	Product owner	> €5.000.000	> 500	1 - 3 years		x
Medical Supplies Pharmaceuticals	Ecommerce manager	> €5.000.000	250 - 500	3 - 5 years	x	
Medical Supplies Pharmaceuticals	Ecommerce manager	€2.500.000 - €5.000.0	100 - 249	3 - 5 years	x	
Medical Supplies Pharmaceuticals	ICT manager	> €5.000.000	250 - 500	1 - 3 years	x	
Waren im British Style	Ecommerce manager	> €5.000.000	100 - 249	Longer than 10 years		
Other	Product owner	€2.500.000 - €5.000.0	250 - 500	1 - 3 years	x	
Other	Markering manager	> €5.000.000	> 500	5 - 10 years	x	
Other	Product owner	€2.500.000 - €5.000.0	250 - 500	3 - 5 years	x	

Table 16: Individual companies comparison

Appendix E - Survey Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
SQ1	42	2	5	3.57	.914	.836
SQ2	42	2	5	3.52	.707	.499
SQ3	42	2	5	3.43	.914	.836
SQ4	42	2	5	3.79	1.001	1.002
SQ5	42	1	5	3.52	.969	.938
SQ6	42	1	5	3.31	.841	.707
SQ7	42	2	5	3.50	.672	.451
SQ8	42	2	5	3.45	.803	.644
SQ9	42	2	5	3.48	.773	.597
PU1	42	2	4	3.38	.697	.485
PU2	42	2	5	3.50	.773	.598
PU3	42	2	5	3.55	.832	.693
PEOU1	42	1	5	3.31	1.070	1.146
PEOU2	42	1	4	3.26	.912	.832
PEOU3	42	1	5	3.12	.968	.937
PEOU4	42	1	4	3.45	.861	.742
PV1	42	2	5	3.64	.879	.772
PV2	42	2	5	3.76	.906	.820
PV3	42	2	5	3.40	.701	.491
PV4	42	2	5	3.79	.871	.758
PR1	42	2	5	3.55	.832	.693
PR2	42	2	5	3.90	.932	.869
PR3	42	2	5	3.95	.825	.681
TRU1	42	2	5	3.83	.621	.386
TRU2	42	2	5	3.83	.986	.972
TRU3	42	2	5	3.98	.811	.658
TRU4	42	2	5	4.02	.841	.707
TRU5	42	2	5	3.74	.734	.539
TRU6	42	2	5	3.76	.726	.527
SAT1	42	2	5	3.67	.816	.667
SAT2	42	2	5	3.48	.740	.548
SAT3	42	1	5	3.60	.964	.930
LOY1	42	1	5	3.50	.862	.744
LOY2	42	1	5	3.14	.814	.662
LOY3	42	2	5	3.40	.939	.881
Valid N (listwise)	42					

Table 17: Descriptive statistics of survey items

Normality Test

	Kolmogorov–Smirnov[a]			Shapiro–Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SQ1	.252	42	<.001	.874	42	<.001
SQ2	.271	42	<.001	.832	42	<.001
SQ3	.210	42	<.001	.881	42	<.001
SQ4	.299	42	<.001	.828	42	<.001
SQ5	.308	42	<.001	.841	42	<.001
SQ6	.247	42	<.001	.823	42	<.001
SQ7	.319	42	<.001	.793	42	<.001
SQ8	.253	42	<.001	.861	42	<.001
SQ9	.251	42	<.001	.856	42	<.001
PU1	.313	42	<.001	.756	42	<.001
PU2	.313	42	<.001	.822	42	<.001
PU3	.230	42	<.001	.872	42	<.001
PEOU1	.264	42	<.001	.884	42	<.001
PEOU2	.315	42	<.001	.770	42	<.001
PEOU3	.223	42	<.001	.870	42	<.001
PEOU4	.380	42	<.001	.676	42	<.001
PV1	.229	42	<.001	.877	42	<.001
PV2	.294	42	<.001	.849	42	<.001
PV3	.290	42	<.001	.829	42	<.001
PV4	.288	42	<.001	.854	42	<.001
PR1	.326	42	<.001	.820	42	<.001
PR2	.255	42	<.001	.852	42	<.001
PR3	.309	42	<.001	.822	42	<.001
TRU1	.368	42	<.001	.765	42	<.001
TRU2	.230	42	<.001	.842	42	<.001
TRU3	.274	42	<.001	.843	42	<.001
TRU4	.211	42	<.001	.840	42	<.001
TRU5	.354	42	<.001	.796	42	<.001
TRU6	.319	42	<.001	.827	42	<.001
SAT1	.301	42	<.001	.847	42	<.001
SAT2	.284	42	<.001	.836	42	<.001
SAT3	.306	42	<.001	.839	42	<.001
LOY1	.362	42	<.001	.735	42	<.001
LOY2	.287	42	<.001	.840	42	<.001
LOY3	.308	42	<.001	.820	42	<.001

Table 18: normality test of survey items

Appendix F - Validity and Reliability Statistics

	LOY	PEOU	PR	PU	PV	SAT	SQ	TRU
LOY1	0.878	0.737	0.488	0.364	0.529	0.723	0.615	0.655
LOY2	0.889	0.566	0.556	0.370	0.583	0.694	0.705	0.664
LOY3	0.853	0.639	0.648	0.437	0.718	0.625	0.708	0.539
PEOU1	0.450	0.804	0.159	0.309	0.210	0.634	0.326	0.280
PEOU2	0.717	0.821	0.559	0.561	0.423	0.561	0.658	0.425
PEOU3	0.625	0.884	0.343	0.508	0.391	0.631	0.531	0.440
PEOU4	0.723	0.899	0.529	0.276	0.461	0.724	0.595	0.538
PR1	0.535	0.456	0.778	0.422	0.378	0.457	0.486	0.435
PR2	0.371	0.250	0.701	0.036	0.590	0.257	0.462	0.357
PR3	0.581	0.389	0.885	0.233	0.629	0.404	0.612	0.596
PU1	0.295	0.480	0.328	0.720	0.241	0.211	0.522	0.365
PU2	0.332	0.339	0.294	0.835	-0.051	0.357	0.390	0.345
PU3	0.413	0.309	0.085	0.772	0.163	0.328	0.309	0.307
PV1	0.650	0.492	0.623	0.251	0.730	0.316	0.480	0.375
PV2	0.270	0.072	0.278	-0.239	0.621	0.303	0.266	0.304
PV3	0.280	0.185	0.302	-0.088	0.589	0.270	0.257	0.181
PV4	0.657	0.420	0.608	0.285	0.891	0.477	0.666	0.728
SAT1	0.806	0.663	0.508	0.374	0.600	0.884	0.688	0.657
SAT2	0.390	0.480	0.178	0.259	0.244	0.730	0.388	0.396
SAT3	0.696	0.719	0.456	0.322	0.340	0.914	0.597	0.525
SQ1	0.710	0.487	0.387	0.308	0.634	0.578	0.783	0.658
SQ2	0.261	0.229	0.273	0.271	0.160	0.347	0.562	0.245
SQ3	0.317	0.222	0.320	0.291	0.263	0.379	0.617	0.473
SQ4	0.663	0.501	0.545	0.477	0.552	0.554	0.861	0.711
SQ5	0.637	0.529	0.528	0.346	0.479	0.524	0.741	0.692
SQ6	0.552	0.511	0.510	0.302	0.426	0.499	0.660	0.415
SQ7	0.449	0.484	0.546	0.323	0.417	0.387	0.523	0.297
SQ8	0.576	0.319	0.548	0.394	0.453	0.369	0.735	0.418
SQ9	0.401	0.463	0.426	0.559	0.377	0.478	0.590	0.449
TRU1	0.449	0.309	0.516	0.236	0.343	0.457	0.564	0.783
TRU2	0.531	0.353	0.557	0.214	0.574	0.445	0.637	0.833
TRU3	0.656	0.493	0.449	0.279	0.578	0.613	0.634	0.862
TRU4	0.610	0.469	0.400	0.437	0.601	0.614	0.646	0.864
TRU5	0.668	0.504	0.658	0.396	0.575	0.578	0.613	0.845
TRU6	0.531	0.244	0.325	0.588	0.375	0.377	0.566	0.676

Table 19: Loadings of the measures.

Appendix G - Detailed result explanation

The analysis of our study reveals insightful relationships between trust (TRU), satisfaction (SAT), and loyalty (LOY) within the e-commerce context. Firstly, trust (TRU) emerges as a significant factor in B2B e-commerce relationships. Customers who trust the e-commerce platform are more likely to exhibit Loyalty (LOY). This relationship is statistically significant ($\beta = 0.364$, $t = 2.973$, $p = 0.001$), indicating a genuine connection between Trust and Loyalty, meaning H1 is accepted. Furthermore, Trust also plays a role in shaping customer satisfaction (SAT) ($\beta = 0.287$, $t = 1.833$, $p = 0.046$). To make sure the effect runs in the right direction, the effect of Satisfaction on Trust was also measured. This result shows that there is no significant effect ($p=0.136$) of Satisfaction on Trust (see Figure 5).

On the other hand, the relationship between satisfaction (SAT) and loyalty (LOY) stands out as notably robust and highly significant. Highly satisfied customers demonstrate significantly greater loyalty. The p-value of less than 0.000 underscores the strength of this connection, highlighting the substantial impact of satisfaction on loyalty. This means very strong support for confirming H3.

A notable finding in the results is that out of the five hypotheses tested, only two were confirmed to have a significant relationship with customer satisfaction (SAT). Specifically, Perceived Ease of Use (PEOU) and Service Quality (SQ) were identified as key determinants of customer satisfaction. In contrast, when it comes to trust within B2B relationships, the results show a different pattern, here, three of the four hypotheses are confirmed, with Service Quality (SQ), Perceives Usefulness (PU) and Perceives Value (PV) found to have an impact. Perceived Risk (PR) is the only variable that has no significant impact on both Satisfaction and Trust, which is surprising. Below, these relationships are described in further detail.

The analysis of our study reveals insightful relationships between the independent variables and trust (TRU) and satisfaction (SAT) within the e-commerce context. Firstly, the influence of Service Quality (SQ) on both Satisfaction (SAT) and Trust (TRU) was examined. The results indicate that Service Quality significantly impacts both Satisfaction ($\beta = 0.561$, $t = 2.989$, $p < 0.001$) and Trust ($\beta = 0.459$, $t = 3.143$, $p < 0.001$), emphasizing the importance of providing high-quality services to enhance customer satisfaction and trust. Thus, H4a and H4b are both supported. Interestingly, the strongest relationships of independent variables are found in the Perceived Ease of Use (PEOU) on Satisfaction. Like service quality, Perceived Ease of Use appears to be an important determinant for Satisfaction ($\beta = 0.561$, $t = 4.737$, $p < 0.001$). Because there is no theoretical evidence of Perceived Ease of Use on Trust, but there is on Perceived Usefulness, this relationship was tested, which was found to be highly significant ($\beta = 0.489$, $t = 4.592$, $p < 0.000$). A logical consequence, then, is that when a system is easy to use, users perceive it as more useful for their own and organizational tasks. Thus, ease of use results in higher levels of satisfaction and perceived usefulness, supporting H6a and H6b.

Moving on to the impact of Perceived Usefulness (PU) on satisfaction (SAT) and Trust (TRU). Interestingly, the effect of Perceived usefulness on Satisfaction ($\beta = 0.115$, $t = 0.738$, $p = 0.230$) was found to be non-significant. However, Perceived usefulness significantly influences Trust ($\beta = 0.200$, $t = 1.826$, $p = 0.032$), supporting H5b but rejecting H5a. This suggests that customers who perceive a product or service as useful are more likely to trust the provider or the system associated with that product or service but may not directly affect satisfaction. Although not a direct relationship on satisfaction is found, it is an important indicator for it given that trust has an impact on satisfaction.

The interesting result of the effect of Perceived Usefulness is equally reflected in the results of Perceived Value. The study examined the effect of Perceived Value (PV) on Trust (TRU) and Satisfaction (SAT). The results indicate a significant influence of Perceived Value on Trust ($\beta = 0.236$, t = 1.727, p = 0.041). However, there is no significant influence on Satisfaction ($\beta = -0.036$, t = 0.227, p = 0.410). This implies that customers trust a product or service more if they perceive it as valuable, but this enhanced trust does not guarantee that they will be fully satisfied with their overall experience. This suggests that perceived value plays a role in building trust, but other factors influence overall satisfaction in e-commerce relationships. Which means that H7a is not supported and H7b is supported.

Lastly, the hypotheses related to Perceived Risk (PR) yielded results that may be seen as somewhat unexpected. Perceived Risk was found to have no significant effect on Trust (TRU) ($\beta = 0.074$, t = 0.476, p = 0.317) or Satisfaction (SAT) ($\beta = 0.32$, t = 0.213, p = 0.416). Consequently, both H8a and H8b are rejected, suggesting that perceived risk does not appear to significantly influence either Trust or Satisfaction in e-commerce relationships. This suggests that contrary to some expectations, customers' perceptions of risk associated with an e-commerce service or product may not substantially impact their overall trust in the service or their level of satisfaction with it.

The direct relationship between perceived risk and loyalty resulted in a significant effect ($\beta = 0.260$, t = 2.461, p = 0.007). This was not hypothesized but was added to the results as clarification for the non-significant effect on loyalty.
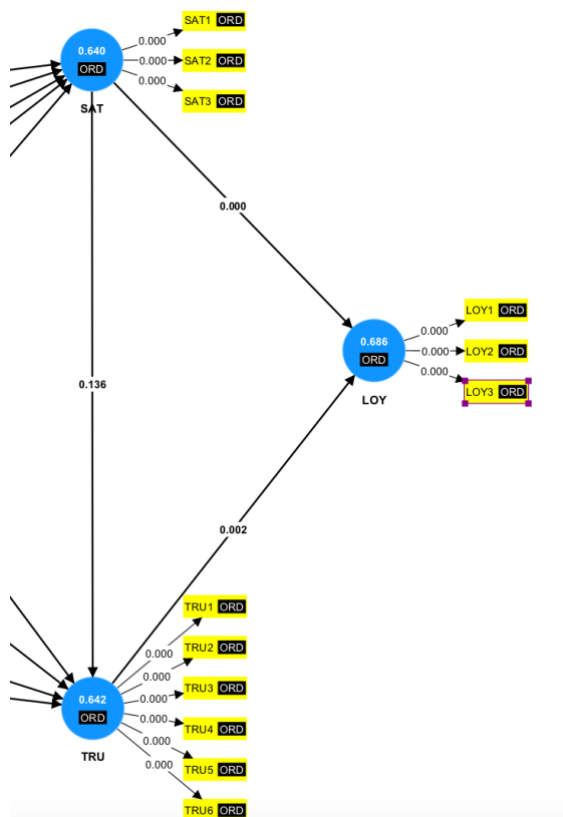

Figure 5: Partial least square graphical output Satisfaction on Trust
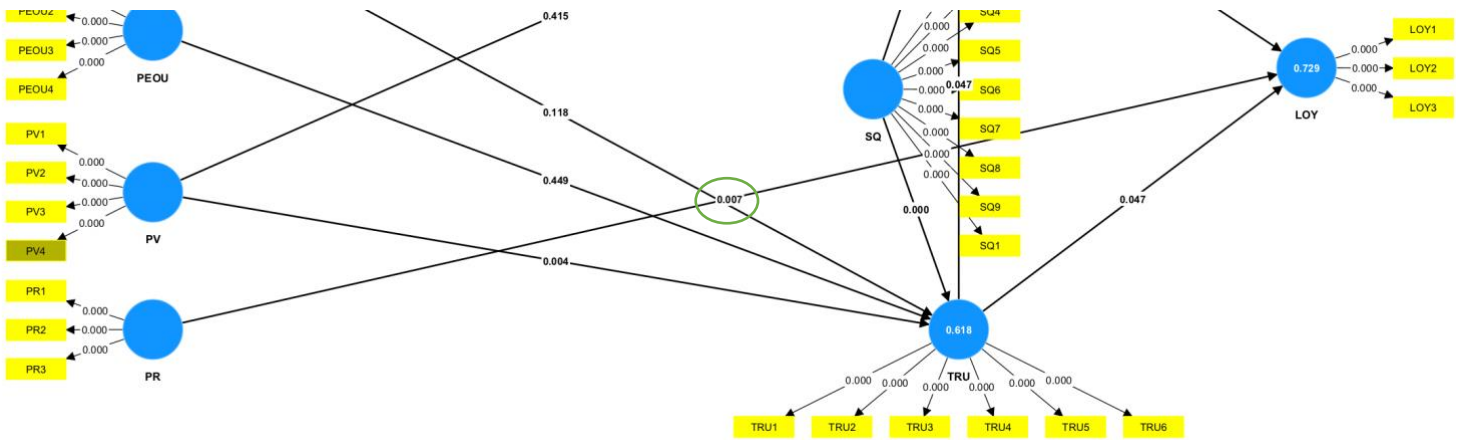
Appendix H – Graphical output PR - LOY

Figure 6: Partial least square graphical output direct effect perceived risk of Loyalty

Appendix I - Multigroup Analysis

Group Statistics

	Time	N	Mean	Std. Deviation	Std. Error Mean
SQ	1.00	26	3.4327	.63662	.12485
	2.00	16	3.7020	.47145	.11786
PU	1.00	26	3.4808	.67053	.13150
	2.00	16	3.4375	.51235	.12809
PEOU	1.00	26	3.3269	.82392	.16158
	2.00	16	3.2188	.81074	.20268
PV	1.00	26	3.6250	.67915	.13319
	2.00	16	3.6875	.48734	.12183
PR	1.00	26	3.7436	.79614	.15614
	2.00	16	3.8958	.45082	.11271

Table 20: Descriptive Statistics based on company size.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.	t	df	One–Sided p	Two–Sided p	Mean Difference	Std. Error Difference	Lower	Upper
SQ	Equal variances assumed	2.075	.158	−1.461	40	.076	.152	−.26932	.18436	−.64193	.10329
	Equal variances not assumed			−1.569	38.480	.062	.125	−.26932	.17170	−.61676	.07812
PU	Equal variances assumed	1.325	.256	.221	40	.413	.826	.04327	.19573	−.35231	.43885
	Equal variances not assumed			.236	37.973	.407	.815	.04327	.18357	−.32836	.41490
PEOU	Equal variances assumed	.033	.856	.416	40	.340	.680	.10817	.26023	−.41778	.63412
	Equal variances not assumed			.417	32.298	.340	.679	.10817	.25921	−.41963	.63598
PV	Equal variances assumed	2.887	.097	−.320	40	.375	.750	−.06250	.19519	−.45698	.33198
	Equal variances not assumed			−.346	38.922	.366	.731	−.06250	.18051	−.42764	.30264
PR	Equal variances assumed	3.203	.081	−.697	40	.245	.490	−.15224	.21838	−.59361	.28912
	Equal variances not assumed			−.791	39.821	.217	.434	−.15224	.19256	−.54149	.23700

Table 21: Multigroup comparison based on company size

Appendix J - Follow-up interviews

Interview Structure

1. Express appreciation to the interviewee for their participation and introduce yourself. Inquire whether they'd like to introduce themselves as well.

2. Request permission to record the conversation.

3. Initiate the discussion with general questions related to the study:

   a. Did you find the survey to be excessively time-consuming?

   b. Was the survey presented in a clear and understandable manner?

   c. Optionally: Do you have any suggestions for improving future surveys?

4. Proceed to inquire about the factors that elicited positive responses.

5. Transition to questions concerning the factors associated with negative responses.

6. Explore the interviewee's perspective on B2B relationships and any identified impediments.

Semi-structured example question:

''You have indicated that FactFinder really contributes to your sales and profitability''

- Can you share more details about FactFinder's contributions to your sales and profitability?

- How in your view does an SaaS organization like FactFinder creates trust?

Coding Schemes

Interview	Statement	Open coding	Axial coding	Selective coding
1	Trust is a kind of foundation for satisfaction because it makes you believe that they consistently deliver on their promises	Consistent delivery	promises	Satisfaction
1	I think SaaS providers need to have clear communication, reliability and quick problem-solving but also definitely renewing service	Clear communication, reliability, quick problem solving	Provider performance	Reliability
1	it's important that there's a lot of guidance for operating the software, employee competency	Guidance for operating	Use competency support	Competence
1	Responsiveness, reliability and how well they handle problems all play a crucial role in determining satisfaction,	Responsiveness, reliability, problem handling	Service quality Factors	Quality
1	a user-friendly interface is a real game-changer. In my view if we find the software user-friendly, the learning curve gets shorter, productivity increases and ultimately satisfaction increases	Shorter learning curve and productivity increase	Usability impact	Quality
1	So, while facilitation is important for that first step of adopting technology, it may not be the whole picture when it comes to building trust over time.	Facilitator in Technology Adoption	Technology adoption	Alignment
1	We are paying for a solution to our problems but also to grow our revenue. So, when we see that the software provides substantial value, in the sense that it justifies the cost, that naturally builds trust.	Need to see software which provides substantial value	Return on investment	Reliability
1	It's about how well the software meets our specific business needs, adapts to change, and consistently delivers results.	How well the software meets our business needs	Business alignment	Alignment
1	It's kind of a baseline expectation in the industry, and factors like GDPR compliance already contribute to this perception.	Baseline explanation	Expectation level	Satisfaction

Table 22: coding scheme interview 1

Interview	Statement	Open coding	Axial coding	Selective coding
2	if you don't have trust, you're always question everything, and you will never be satisfied. it's self-fulfilling. It's a circle of things that reinforces some stuff.	Self-fulfilling circle, which reinforces some stuff	Trust-Dissatisfaction Loop	Satisfaction
2	Some blueprints or white papers, so some examples like implementation which were working on FactFinder can showcase that to the customers that will gain as well.	Blueprint and white papers	User support	Alignment
2	the people behind the fact Finder know what to do and know how ecommerce works.	People know what to do	Employee competency	Competence
2	it's important to have a timely and qualified response.	Timely and qualified response	Effective communication	Quality
2	Would be as well different of interest for another department or another person who is interested in the return on investment for that product. So I think the marketing guys and even I for implementing responsible for the implementation, we don't, we don't care so much about that	Different interests in different goals	Interdepartment Alignment:	Alignment

Table 23: coding scheme interview 2

Interview	Statement	Open coding	Axial coding	Selective coding
3	I can get immediate help from FactFinder, but the all-important thing is that the system continuously stays up to date.	Immediate help and system consciously	Continuous System Maintenance	Quality
3	It seems to me that when FactFinder understands our business goals, it also adjusts all training and onboarding conversations accordingly	Adjusted Training and onboarding conversations	Customer centric approach	Alignment
3	Working efficiently and effectively with FactFinder is the most important aspect of our partnership.	Working efficiently and effectively	Partnership success	Satisfaction
3	When you're familiar with the user-friendly backend of a system like FactFinder, it reduces the likelihood of encountering issues or challenges.	User-friendly back-ends reduces problems	Backend benefits	Satisfaction
3	It's all about that initial learning curve, and once you're past it, the system feels much more manageable and user-friendly.	Learning curve for system manageability	Learning curve impact	Alignment
3	I've found that FactFinder offers some unique and valuable functions that might not be as straightforward to find in other systems	Unique and valuable functions	Distinctive functionality	Satisfaction
3	The capacity to translate complex technical details into understandable information for a diverse audience is key to reliable and effective communication.	Translation complex details in understandable info	Effective communication	Competence
3	These employees need to excel at both the technical aspects of the solution and the art of clear, effective communication to be considered reliable and competent.	Employees technical excellence and clear effective communication	Competences	Competence
3	Combination of a user-friendly platform and reliable, responsive individuals contributes to a satisfying partnership with a SaaS provider.	Combination of platform and competence employees	Satisfying partnership	Satisfaction
3	An organization like FactFinder creates trust through the relationships and connections formed, particularly with the consultant.	Bonding bound consultants	Trust building	Satisfaction

Table 24: coding scheme interview 3

Interview	Statement	Open coding	Axial coding	Selective coding
4	Technical aspects such as the availability and scalability of the search engine are absolutely essential and , the services related to platform modifications are of great significance	Technical Aspects, Availability, Scalability, Platform Modifications	Service Quality, Technical Functionality	Qaulity
4	the consultancy aspect. It's not just about providing a product; it's about guiding us in making the best use of it.	Consultancy guiding	Value enhancement	Alignment
4	FactFinder provides us with a remarkable level of flexibility. We've found that we can easily modify and configure it to suit our specific requirements. The ability to adapt FactFinder to our needs has been a significant advantage, and it's something we consider quite unique.	Flexibitly modify and configure	Customization	Satisfaction
4	So, having FactFinder understand our business goals is vital because it allows us to harness this flexibility and tailor the solution to our needs effectively.	Understand Business Goals, Flexibility, Tailor Solutio	Business alignment	Alignment
4	This agility enables us to respond promptly to evolving market trends and complex business demands.	Agility, Respond Promptly, Evolving Market Trends, Complex Business Demands	Responsiveness	Qaulity
4	the flexibility in setting up and configuring the search, the post-search navigation, and the advisor feature, all of these aspects have been significant advantages	Flexibility, Setting up and Configuring the Search	Flexibility	Satisfaction
4	The post-search navigation tools are quite user-friendly and make it easy for our customers to find what they're looking for, enhancing their overall experience.	User-friendly, Easy, Customer Experience	User-firnedly	Satisfaction
4	FactFinder's consistency and continuous innovation have set it apart throughout our long-standing partnership.	Consistency, Continuous Innovation, Long-standing Partnership	Partnership factors	Alignment
4	one area where there has been room for improvement is the user interface. Historically, it seemed a bit developer-centric, making it less user-friendly. So, a requirement would be to design the UI with end-users in mind, ensuring it's intuitive and easy to navigate	User Interface Improvement	Intuitively	Qaulity
4	The FactFinder team should have a strong grasp of the intricacies of our industry and our unique requirements to provide us with tailored solutions. This understanding of our business context is what sets them apart and makes the collaboration valuable.	intricacies of our industry and our unique requirements	Industry-Specific Expertise	Alignment
4	I know many of their colleagues, and the fact that they are located in Germany means we've had numerous face-to-face meetings in the past. It's not like dealing with just any software company somewhere across the world.	German located, face-to-face meetings	Personal relationshups	Alignment

Table 25: coding scheme interview 4