

**Assessing Service Quality and Its Influence on Customer Satisfaction in a SaaS Context: A
Case Study of Pragati IT Solution, Nepal**

By Roman Shrestha

ID No.:

Supervisor

Dr. Lorraine Limbrick

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Abstract

This study investigates the dimensions of service quality and its influence on customer satisfaction within the Software as a Service (SaaS) context of Pragati IT Solution, Nepal, which is a rapidly growing provider of cloud-based Information Management System (IMS) software for educational institutions in Nepal. Despite the SaaS service quality being widely researched in developed countries, limited empirical studies exist in the context of underdeveloped countries like Nepal. This study is guided by the SaaS-Qual framework developed by Benlian et al. (2011) and adopts a positivist philosophy, deductive approach, mono-method quantitative design, and cross-sectional survey strategy to assess key service quality dimensions such as responsiveness, rapport, reliability, feature, flexibility and security. Primary data were collected from 129 active SaaS users through a structured questionnaire and analysed using descriptive statistics, reliability and validity tests, Principal Component Analysis, correlation analysis, and regression modelling.

Findings of the study indicate that flexibility, reliability, and features are the strongest constructs for shaping users' perception of service quality of Pragati IT Solution, Nepal, whereas responsiveness, rapport, and security also contribute meaningfully but with lower relative influence. Furthermore, the relationship between service quality and overall customer satisfaction is positive but with a weak association, which suggests that overall customer satisfaction is not only influenced by service quality but also by other contextual factors such as usability, expectations, organisational needs, and cost-value perceptions etc (Delone and McLean, 2003). High multicollinearity among service quality dimensions further suggests that users evaluate SaaS quality as an integrated experience rather than isolated attributes (Jimenez Fernandez and Ruiz Martos, 2020).

This study contributes context-specific empirical evidence to the limited SaaS service quality and customer satisfaction research in Nepal and offers actionable recommendations, such as enhancing system flexibility, strengthening reliability, optimising feature design, and improving the user support mechanism for Pragati IT Solution and other Nepalese SaaS providers (Good, Mangus and Ellen Bolman Pullins, 2023). The research also highlights methodological and practical limitations and identifies opportunities for future studies to explore mediating variables and longitudinal user experience in Nepal's evolving SaaS ecosystem.

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Chapter 1

1.1 Introduction

In recent years, the significance of Software as a Service (SaaS) has been gradually increasing because SaaS provides organisations with scalability, cost efficiency, flexibility, and also offers high-end computing solutions without requiring heavy infrastructure investments. Service quality is a multidimensional evaluative judgement by users on how well service providers meet users' expectations among different performance dimensions like reliability, responsiveness, assurance, empathy, tangibles, digital integration, sustainability, training, service efficiency, etc, and which performance influences users' level of satisfaction (Huang, Lee and Chen, 2019).

A SaaS business primarily operates on a subscription-based revenue model. Thus, this sector always contains high pressure of customer satisfaction because satisfied customers maintain consistent demand for products and services, while service quality is key to creating and delivering utilities to customers, which ultimately influences customer satisfaction (Agarwal and Dhingra, 2023). Appropriately measuring the service quality and its impact on customer satisfaction is crucial for any business; however, in the SaaS business context, it becomes more significant due to the virtual nature of the business context that possesses unique challenges (Freitas & Neto, 2017).

1.2 Background of the Research Problem

Pragati IT Solution, Nepal, provides a cloud-based Information Management System (MIS) to Nepalese educational institutions to enhance the operational efficiency of the organisation's operations. It was established in 2018 and is experiencing exponential growth in its revenue and customer acquisition. Currently, it is providing a SaaS MIS solution to more than 2000 educational institutions, mainly schools and colleges in Nepal. However, Pragati IT Solution, Nepal, has a long-term vision to expand its SaaS services in international SaaS markets (Neupane, 2018).

Although Software as a Service (SaaS) has been commercially applied for a few decades, globally, SaaS has emerged as a dominant model for software delivery because of its characteristics like scalability, flexibility, economy and easy deployability. At the same time, multiple research studies are conducted in the sector of SaaS service quality, customer satisfaction, specifically in developed countries; however, there is a significant research gap in both academic and practical contexts of developing and underdeveloped countries. For example, Bhattacherjee (2001) took samples from the United States, Benlian, Koufaris and Hess (2011) researched Germany, Yang and Lin (2015) were from Taiwan, and Olde Klieverik (2023) was from the Netherlands. However, it is still considered a novel practice in underdeveloped countries like Nepal (Ghimire et al., 2024). The understanding of service quality determinants and their influences on customer satisfaction in the context of SaaS applications is crucial to maintaining smooth business operations and sustainable growth and expansion for the SaaS providers.

1.3 Scope of the Study

1.3.1 Research Aim

This study aims to assess service Quality and Its Influence on Customer Satisfaction in a SaaS Context with a specific case study of Pragati IT Solution, Nepal

1.3.2 Research Questions

- What are the key dimensions of measuring service quality relevant to the SaaS context of Nepal?
- How does service quality influence customer satisfaction among SaaS users at Pragati IT Solution, Nepal?

- What improvements could be recommended to enhance service quality and customer satisfaction for Pragati IT Solution Nepal and other Nepalese SaaS providers?

1.3.3 Research Objectives

- To critically identify the key performance dimension of service quality as perceived by end users.
- To critically analyse the relationship between service quality and customer satisfaction.
- To provide critical recommendations for Pragati IT Solution, Nepal and other Nepalese SaaS providers to enhance service quality and improve customer satisfaction.

1.3.4 Research Deliverables

This research delivers a comprehensive set of outputs aligned with the stated objectives and the empirical focus of the study. First, it operationalises the SaaS-Qual framework to identify and contextualise the key performance dimensions of service quality, such as reliability, responsiveness, rapport, flexibility, features and security as perceived by end users of Pragati IT Solution (Benlian et al., 2011; Chou, 2019). Second, it provides a detailed quantitative analysis of respondent demographics and core constructs alongwith testing internal consistency, which delivers a clear overview of user perception (Benlian et al., 2011). Third, it conducts correlation and regression analyses to critically examine the relationship between service quality dimensions and customer satisfaction, which identifies the most influential service quality attributes (Benlian et al., 2011). Finally, the study produces a set of actionable, evidence-driven recommendations for Pragati IT Solution and other Nepalese SaaS providers to enhance service quality, strengthen customer satisfaction and support data-driven strategic and operational improvements within the SaaS sector.

1.4 Outline of Methodology

The outline of the methodology for this study is designed based on the research onion concept (Saunders et al., 2023) that provides a structured process of methodological decision-making from philosophical assumption to data collection and analysis. A brief outline of the methodology provided follows, and detailed methodological choices and rationale behind the choices are discussed in Chapter 3.

This study follows the positivist research philosophy because the literature on service quality and customer satisfaction, which is mentioned in appendix 3.1, almost all of the studies followed the positivist research philosophy (Parasuramana et al., 1985; Parasuraman et al., 1988; Bhattacherjee, 2001; Benlian et al., 2010; Benlian et al., 2011; Freitas and Freitas Neto, 2017; Chou, 2019; Liu and Prybutok, 2020; Olde Klieverik, 2023), which assumes that reality is an objective, which is stable, and can be measured through observation in quantifiable phenomena (Benlian, Koufaris and Hess, 2011; Saunders et al., 2023). Furthermore, the positivist approach is appropriate for this study because it aims to measure generalisable statistical relationships between service quality dimensions and the level of customer satisfaction at Pragati IT Solution, Nepal, through quantitative data and hypothesis testing (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024), and detailed alternative research philosophies are discussed in chapter 3.

Following this philosophical foundation, this study adopted a deductive approach to theory development, which begins from pre-established theories or hypotheses and then tests them through empirical data (Parasuramana et al., 1985; Parasuraman et al., 1988; Bhattacherjee, 2001; Benlian et al., 2010; Chou, 2019; Liu and Prybutok, 2020; Olde Klieverik, 2023; Saunders et al., 2023). The research is based on the SaaS-Qual framework developed by Benlian et al. (2011), which identifies key service quality performance dimensions such as reliability, responsiveness, usability, security and support. This study tested the hypothesis to understand how these factors influence the users' satisfaction in the context of Nepalese SaaS context. Furthermore, other approaches and compatibility are deeply analyzed in Chapter 3, the research approach section.

Mono-method quantitative choice (Saunders et al., 2023) was employed by focusing on the collection of numerical data to establish a statistical relationship between variables. Based on studies of Bhattacherjee (2001), Benlian et al. (2010), Chou (2019), Liu and Prybutok (2020), and Olde Klieverik (2023). (see Chapter 3, section 3.5 Methodological Choice section for further discussion)

This research adopted a survey-based strategy, which allows for the collection of a large volume of quantitative data in minimal time and resources to measure variables and impacts, understanding patterns, and statistical relationships between different variables, such as service quality and customer satisfaction (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). The survey questionnaire comprises closed-ended statements and measures on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to convert responses of Pragati IT Solution's SaaS users into a quantitative form, and the survey was conducted via online platforms. (see Chapter 3, section 3.4 Research Strategy section for further discussion)

This study adopted a cross-sectional time horizon (Saunders et al., 2023), where data is collected at a single point in time as a quick snapshot. This approach is efficient and appropriate for collecting current data to understand the present relationship between service quality and customer satisfaction among SaaS users of Pragati IT Solution (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). (see Chapter 3, section 3.6 Time Horizen section for further discussion)

Although the stratified probability sampling provides the best representation and chance to participation in the survey for the entire population (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024), a non-probability haphazard convenience sampling approach (Saunders et al., 2023) was used to select participants who are easily accessible and willing to respond. This method is appropriate for practical limitations and time constraints (Etikan, Musa and Alkassim, 2016).

Data was analysed by using descriptive and inferential statistical techniques (Saunders et al., 2023). Descriptive statistics such as mean, median, mode, and standard deviation will help to summarise the respondents' perception, and Principal Component Analysis (PCA) is performed to find out the component contribution weight for service quality constructs. Inferential statistical

techniques such as correlation and multiple regression helped to test the statistical relationship between service quality performance dimensions and customer satisfaction (Field, 2018). To ensure reliability, Internal consistency of the constructs is measured by using Cronbach's Alpha with a threshold of 0.7 or higher to confirm internal reliability (Nunnally & Bernstein, 1994).

This research addressed all ethical guidelines of Ulster University (2018) and received ethical approval from the university, as provided in Appendix 3.6. For example, informed consent was provided to all participants with detailed information about possible risks, voluntariness, and withdrawal rights. Confidentiality was maintained during and after the entire research period by anonymising data, storing it securely, adapting digital data protection protocols and complying with GDPR guidelines. Risk assessment was conducted to enhance the physical and emotional well-being and safety of all participants. Conflict of interest was minimised during participant selection, data collection, data analysis, and reporting periods.

1.5 Research Significance

This study holds significance on both theoretical and practical grounds. Empirically testing the relationship between service quality and level of customer satisfaction within the SaaS context contributes to filling the research gap in underdeveloped countries like Nepal (Ghimire et al., 2024). Existing literature primarily focuses on developed countries, so this research delivers context-specific evidence which helps the understanding of the SaaS service quality and users' satisfaction relationship in underdeveloped countries (Chou and Chiang, 2013; Basiran and Yusof, 2021; Li and Kumar, 2022). For example, Bhattacherjee (2001) took samples from the United States, Benlin et al. (2011) researched Germany's context, Yang and Lin (2015) were from Taiwan, and Olde Klieverik (2023) was from the Netherlands. It is considered a novel practice in underdeveloped countries like Nepal (Ghimire et al., 2024). Similarly, the findings provide evidence-based insights to improve service delivery, design customer-oriented strategies, and strengthen retention mechanisms in the SaaS business. Specifically, Pragati IT Solution, Nepal, can utilise the findings to prioritise the service quality dimensions which strongly associated with

a high level of satisfaction, which can help in a competitive business environment (Benlian et al., 2011; Olde Klieverik, 2023). Moreover, the research supports policymakers and IT entrepreneurs in understanding how service quality affects user satisfaction and digital service adoption, thereby contributing to Nepal's digital transformation agenda.

1.6 Dissertation Structure

The dissertation is organised into five chapters:

Chapter 1: Introduction

Introduction to the research topic, background of the research problem, scope, outline of methodology, research significance, and dissertation structure.

Chapter 2: Literature Review

Critically reviews prior studies on SaaS, service quality and customer satisfaction frameworks and hypotheses.

Chapter 3: Research Methodology

Provide a detailed explanation about research philosophy, approach, method Choice, time horizon, techniques and producer, ethical considerations.

Chapter 4: Findings, Analysis and Discussion

Present quantitative analysis findings, description, analysis, evaluation, critical discussion and link with the literature review.

Chapter 5: Conclusions and Recommendations

Summarise key conclusions, recommendations, limitations and direction for future research.

Chapter 2

2.1 Chapter Overview

This chapter provides a critical review of theoretical and empirical literature related to service quality and customer satisfaction by particularly focusing on the Software as a Service (SaaS) context. It aims to establish a conceptual foundation and highlight the existing research gaps that inform the current study on Pragati IT Solution, Nepal.

This chapter begins with a company overview of Pragati IT Solution, Nepal, by outlining its core business operations, services, and its position in the Nepalese SaaS industry. This chapter establishes the organisational context for the study and explains why Pragati IT Solution, Nepal, is an appropriate case for investigating its service quality and customer satisfaction.

The next section focuses on the theme and critically reviews conceptual frameworks and theoretical models of service quality and customer satisfaction in the context of SaaS by specifically focusing on Pragati IT Solution, Nepal. It begins with exploring theoretical frameworks like the SERVQUAL model (Parasuraman, Zeithaml and Berry, 1988) and SaaSQUAL model (Benlian et al., 2011) to explain the multi-dimensional service nature and its influences on customer satisfaction. Then, examines empirical studies that have adapted these models to the SaaS context and highlights critical determinants of service quality and customer satisfaction, such as reliability, responsiveness, security, feature quality, etc (Benlian et al., 2011; Chou and Chiang, 2013; Chou, 2019; Olde Klieverik, 2023). Similarly, identify research gaps on the SaaS services and customer satisfaction context of underdeveloped countries, specifically in Nepal, to justify the current case study approach.

Furthermore, this chapter synthesises key findings from studies on the relationship between service quality and customer satisfaction in the SaaS context. Empirical evidence continuously shows that the positive correlations between service quality and customer satisfaction (Benlian et al., 2011; Freitas and Freitas Neto, 2017; Olde Klieverik, 2023). However, contextual factors such as cultural perceptions, local market expectations and organisational service delivery structures remain underexplored in underdeveloped countries like Nepal.

Finally, this chapter develops a hypothesis to examine the influence of service quality on customer satisfaction within the SaaS context of Pragati IT Solution Nepal. The dimensions of the service qualities, such as reliability, responsiveness, rapport, security, feature and flexibility, are considered as independent constructs and overall service quality is considered as a dependent construct. This review forms the foundation for the study's conceptual framework and guides subsequent methodological design.

2.2 Company Overview

The Pragati IT Solution was registered in 2018 in Nepal as an information and technology solutions provider, and it offers multiple IT-related solutions, such as Computer Hardware Solutions, Regular Computer Software Solutions, Security System with Hardware Solution integration, etc. However, according to the General Manager of Pragati IT Solution, Nepal, its prominent business is to provide an Information Management System (IMS) named 'Veda' to educational institutions across Nepal, which contributes more than 80 per cent of the total revenue of the company. The Veda system is designed as a SaaS software solution model where users can buy a subscription annually. This IMS helps to automate the end-to-end process of school or college management process such as account management, finance management, result building & publishing, establishing online relationships with students, parents, teachers & school management, security biometric software, and a learning management platform. Technical team lead, MR. Amrit Adhikari clarified that, because of the Software as a Service (SaaS) delivery model of the company, users can access all systems through the internet easily at an economic cost and can store, view and extract all data in one go. The company is growing very rapidly in the Nepalese local market with its SaaS product. However, although the customer retention rate of the company is more than 98%, the company has started to face customer satisfaction issues because of the increasing size of the company and a lack of adequate research regarding customer satisfaction. On top of that, the company has a long-term goal to expand its services beyond the Nepalese border. Thus, the company wants to conduct research regarding service quality and customer satisfaction to improve customer satisfaction through better services (Neupane, 2018).

2.3 Focus on Main Theme

2.3.1 Customer Satisfaction

Customer satisfaction is the cornerstone of any service-based industry, and customer perceptions are formed through the user experience of the product or services. In research on information systems (IS), Bhattacherjee (2001) conceptualised customer satisfaction as the positive feeling a person has that leads to appreciating the job, and DeLone and McLean (2003) define customer satisfaction in information system (IS) context as customer satisfaction is defined as users' overall evaluation of how well the information system meets their needs and expectations. In the context of SaaS, evaluation translates to whether the cloud-based applications and associated services meet customer expectations or not (Chou and Chiang, 2013). It is crucial to address customer expectations because customers have high demand these days, disgracing customer expectations could be costly for any organisation. Shil, Ali and Paiker (2010) suggest that companies can maximise their profits by keeping their customers satisfied; therefore, customers become a 'representative' through word-of-mouth. Prior studies measured satisfaction as a technical component rather than socio-technical factors, particularly communication, which was lacking in those studies (Basiran and Yusof, 2021). Unlike traditional models, SaaS operates in a virtual and automated environment, which adds complexities to evaluating the service quality and direct impact on customer satisfaction (Freitas and Neto, 2017). Hariguna and Ruangkanjanases (2024) argue that the deployment of Artificial Intelligence (AI) in customer service makes measuring service quality and customer satisfaction more complex, even though AI can improve the service quality itself.

Based on the review of studies, the quality of service plays a vital role in overall customer satisfaction because it helps to meet customer expectations; thus, the general belief is that the better service quality leads to higher customer satisfaction, in contrast, DeLone and McLean's (2003) IS Success Model, which emphasises that satisfaction arises from multiple interrelated constructs, including system quality, net benefits, and user expectations but customer satisfaction based on service quality is extensively researched in the literature, (Carlson and O'Cass (2010); Benlian et al. (2011); Kao and Lin (2016); Zhou et al. (2019); and Olde Klieverik (2023)) underlining the positive effect. New dimensions of measuring customer satisfaction are introduced during the shift from traditional physical services to traditional IS Serv-Qual and now modern electronic services.

Traditional service quality models are not able to meet the requirements for establishing a comprehensive representation of the service quality in the SaaS context (Du et al., 2013). Based on studies of Bhattacherjee (2001), Benlian et al. (2011), and Freitas and Freitas Neto (2017), SaaS service quality and customer satisfaction have a strong positive correlation with scores of 0.525, 0.513, and 0.827, respectively. Therefore, this study explores service quality models, their evolution, extension, and constructs development, and finally tests and validates the appropriate model in the SaaS context of Pragati IT Solution, Nepal.

2.3.2 Software as a Service (SaaS)

Software as a Service (SaaS) is a type of cloud computing where a connection is made with an off-site location, and services are provided through the internet (Freitas & Neto, 2017; Martins et al., 2019). This means that the entire infrastructure and software algorithms owned by the SaaS service providers and multiple customers are allowed to access the software via an internet connection from anywhere in the world. The most prominent example of a SaaS service is an email, which is available for everyone from every location via the internet. ‘Cloud Computing’ word coined by Google in 2007 and became popular among users, large corporations and SMEs extensively (Chou, 2019).

Despite the concept of cloud computing emerging in the 1960s, it took a long time to develop sufficient technology and infrastructure for larger adoption, which was widely used by Google, Amazon and Microsoft in the early 2000s (Qian, Luo, Du & Guo, 2009). Moreover, there are three variations within cloud computing, which are Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS). SaaS provide the entire infrastructure to host software in the cloud; however, IaaS and PaaS offer certain portions of cloud services for application deployment. As a result, SaaS customers do not need to buy anything else rather than a subscription to the software (Benlian et al., 2011; Basiran & Yusof, 2021; Olde Klieverik, 2023). Because of the advantages such as cost-effectiveness and flexibility, nowadays, most individual users and many SMEs are rapidly shifting towards a SaaS solution. Users can now purchase services on the internet as they require, as opposed to the past customers who needed to buy the entire system and infrastructure in a certain location. SaaS pricing is more personalised; users can

buy different service packages according to their requirements, such as subscribing for an hour, a month or any time length with required functionality packages and price (Benlian et al., 2011; Freitas & Neto, 2017; Basiran & Yusof, 2021).

3.2.3 Service Quality

Service quality is a topic which is extensively researched. In the mid-eighties, Parasuraman, Zeithaml, and Berry (1985) introduced the SERVQUAL model with a twenty-two-item scale to measure the quality of service for products and goods that a company provided to their customers. Unlike measuring the service quality of products and goods, measuring the quality of service was difficult because it was perceived differently by different people. Therefore, the SERVQUAL model came with perceived quality and objective quality with five dimensions: assurance, empathy, reliability, responsiveness and tangibles (Parasuraman, Zeithaml & Berry, 1985). Over time, the SERVQUAL model serves as a foundation model to design models for measuring service quality, such as the IS-SERVQUAL (Kettinger & Lee, 1997; Bhattacherjee, 2001) and the ASP-QUAL model (Sigala, 2004). However, Benlian et al. (2010) argued that the use of the aforementioned is not appropriate for investigating the service quality of SaaS because of the different characteristics of the SaaS service context. Through comparing and analysing multiple service quality measuring models, and introduced a model named the SaaS-Qual model to measure service quality for SaaS providers, which has 42 items and they distributed over the six factors: rapport, responsiveness, reliability, flexibility, features and security.

Since the development of the SaaS-Qual model, numerous studies have adapted or extended it with or without combining it with other frameworks. For example, Basiran and Yusof (2021) explored SaaS-Qual alongside Parasuraman et al. (1988) SERVQUAL model, DeLone and McLean (2003) IS Success Model, and the HOT-fit framework by Yusof et al. (2008). Insights of this study are which socio-technical factors are important constructs for the SaaS service provider and customer relationship, and also emotional sensitivity, problem-solving capacity and quick response. Basiran and Yusof's (2021) study examines the following five factors: assurance, empathy, responsiveness, reliability and communication, alongside the subfactors training, knowledge, availability, effectiveness and efficiency. On the other hand, Chou (2019) used the SaaS-Qual framework for

the foundation model, but included the construction of relationship quality from Crosby, Evans and Cowles (1990), where satisfaction and trust are the key indicators of the relationship quality. Chou (2019) suggested that higher relationship quality leads to better customer trust and can lead to long-term benefits.

2.3.4 Identification of Factors

Based on prior studies and existing literature about service quality and customer satisfaction, it is possible to draw up a list of factors which can be used to determine service quality in the SaaS context. The SERVQUAL model of Parasuraman et al. (1988) serves as a foundation model; however, Benlian et al. (2011) modified it to measure in the SaaS services delivery context as a SaaS-Qual framework, which has a comprehensive list of service quality measurement factors. Although it has a comprehensive list of service quality factors, other practitioners modified the SaaS-Qual determinants to measure service quality and customer satisfaction in different articles. Freitas and Neto (2017), Chou (2019) and Olde Klieverik (2023) drew on new factors to gain new insight into the relationship between constructs such as trust and cost-effectiveness. Table 2.1 shows the most important factors selected for model development, derived from Appendix 2.1, where the model evolution process is described from previous literature.

Table 2.1: Most Important Concepts from Literature

Publication	(Parasuraman, Zeithaml and Berry, 1988)	(Benlian, Koufaris and Hess, 2011)	(Chou and Chiang, 2013)	(Freitas and Freitas Neto, 2017)	(Chou, 2019)	(Liu and Prybutok, 2020)	(Olde Klieverik, 2023)	Used models
Model	SERVQUAL	SaaS-Qual Model	SaaS Model	Alternative to SERVQUAL and SERVPERF	SaaS-CRM	Integrated SOR and IT continuance decision model	SaaS-Qual Model	
Factors	Reliability	√	√		√	√	√	6
	Flexibility		√	√	√	√	√	5
	Responsiveness	√	√		√		√	4
	Rapport		√	√	√		√	4
	Features		√		√		√	3

	Security		√			√			2
Constructs	Satisfaction Level		√	√		√		√	4

Source: (Authors' own work)

Table 2.2 presents the most popular factors and definitions from previous literature and model evolution, which clearly represents that the SaaS-Qual model of Benlian et al. (2011) is ideal for measuring the service quality of SaaS deliveries.

Table 2.2: Selected Factors and Construct

Independent Variables	Definition
Reliability	The ability to provide services accurately and on time
Flexibility	Freedom of customers in functionalities and contractual changes
Responsiveness	The ability to provide an available and performing application
Rapport	The ability to provide comprehensive support
Features	Key functionalities and design features of the software, meeting customer requirements
Security	The ability to provide secure services and protect customer data
Constructs	Definition
Satisfaction	Thought of customers to keep using the software

Source: Definition of variables and constructs, Olde Klieverik (2023)

2.3.5 Relationship Between Themes

Reliability refers to the services being always available for SaaS users, which helps to ensure better service quality (Olde Klieverik, 2023). Based on the research of Benlin et al. (2011), reliability affects the SaaS-Qual model with a 0.121 weight score. Moreover, Chou (2019) finds similar results with a lower effect on service quality. On the other side, Freitas and Neto (2017) and Liu and Prybutok (2021) emphasise the importance of reliability and thus are relevant to include. The survey questions (see Appendix 3.5) were developed based on Benlian et al. (2011), as these were more suitable to measure the reliability of software than the questions of Freitas and Neto (2017).

Flexibility in the SaaS environment refers freedom for customers to make adjustments and scale the services according to their preferences (Olde Klieverik, 2023). According to Chou (2019) and Liu and Prybutok (2021), flexibility is a core factor of service quality in the SaaS context, which significantly contributes to measuring service quality. Furthermore, based on Benlian et al.'s (2011) research paper, the contribution of flexibility to service quality is 0.201, which was the third most important construct.

Responsiveness is mainly oriented toward the quality of software and the quality of personnel; these two indicators demonstrate the greatest impact on service quality (Chou, 2019). Based on Benlian et al. (2011) weight between responsiveness and service quality is 0.388, which is the highest weight among all six factors. However, Chou and Chiang (2013) and Liu and Prybutok (2021) decided to exclude responsiveness factors from their model, assuming it is not appropriate for the cloud computing context. However, in the context of B2B IMS software systems of Pragati IT Solution, Nepal, software quality and support mechanisms are very crucial for the smooth use of the system.

Rapport is a combination of assurance and empathy, which includes all aspects of service providers' knowledge and understanding in order to provide customer support (Olde Klieverik, 2023). Based on the paper of Benlian et al. (2011) and Chou and Chiang (2013) use a similar survey item to measure this factor. However, Chou and Chiang (2013) deleted the shared problem approach because of low loadings. Moreover, Neitas and Freto (2017) added the business process factor in relation to extending its impact on measuring service quality.

Features represent the technical side of the SaaS service, which examines how software design supports ease of use and a user-friendly interface (Olde Klieverik, 2023). Although based on Benlian et al.'s (2011) paper, features showed minimal weight with service quality, with a weight value of 0.119. According to Olde Klieverik (2023), it is useful to know if users believe the software has sufficient features or that something is lacking. Because of a relatively weak influence on service quality, academic studies may give limited attention to it (Benlian et al., 2011; Chou, 2019).

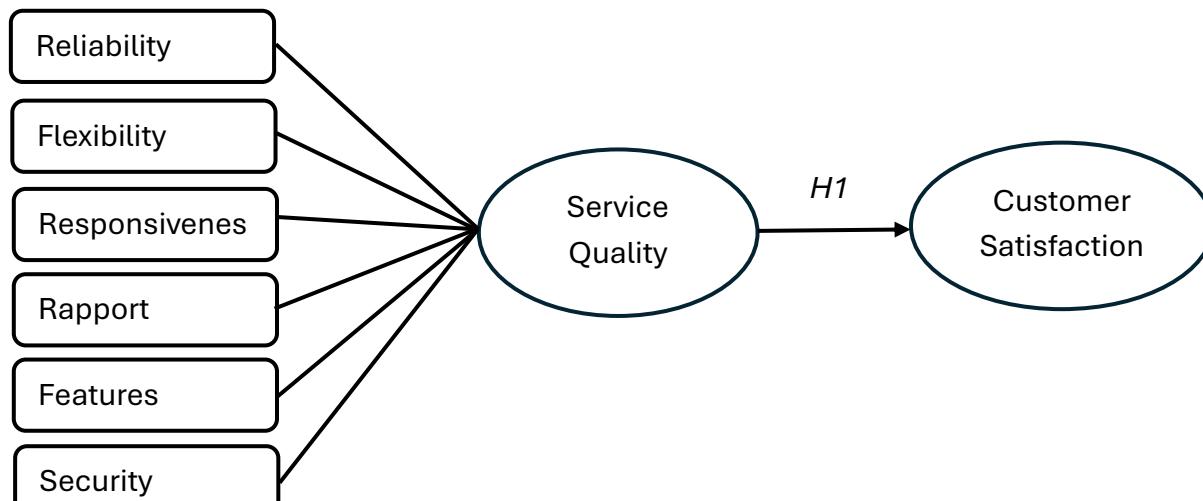
Security concerns are out of the reach of SaaS users because they are completely maintained by SaaS providers or data centres. Thus, this factor has a mixed opinion in prior literature, such as based on Benlin et al. (2011) showed the second greatest contribution weight with service quality. Moreover, Chou (2019) demonstrates its significant impact. However, Chou and Chiang (2013), Freitas and Neto (2017), Liu and Prybutok (2021), Basiran and Yusof (2021), and Olde Klieverik (2023) excluded these factors because they do not reach end users. Because of customers' perception regarding data and its security matters for perceived service quality, this study includes security as a factor of service quality.

Satisfaction of customers with to service quality concept stems from a study of Parasuraman et al. (1988), where the level of customer satisfaction was determined by measuring service quality. Furthermore, Bhattacherjee (2001) examines the same hypothesis with information system (IS) service providers, where the hypothesis was accepted, with the relationship between service quality and customer satisfaction having a Moderate positive correlation with a correlation score of 0.525. Similarly, Benlin et al. (2011), Chou and Chiang (2013), Freitas and Neto (2017), Liu and Prybutok (2021), Basiran and Yusof (2021), and Olde Klieverik (2023) conducted studies based on the same relationship in the SaaS services context and evidences clearly shows that the service quality is a good parameter of customer satisfaction measurement. Thus, this study also measures the service quality with the SaaS-Qual model and examines the relationship between service quality and its influence on customer satisfaction of Pragati IT Solution, Nepal's customers.

2.4 Research Framework and Hypothesis Development

Based on reviewing the main theme and its relationship from the previous literature, a research model that is Benlin et al.'s (2011) SaaS-Qual framework has been developed for this study, which is presented in Figure 2.1, where Service quality is a construct and reliability, flexibility, responsiveness, rapport, features, and security are the determinants of the service quality. Although several improvements have been made in the SaaS-Qual framework for different contexts, such as Chou and Chiang (2013) used flexibility and rapport to measure service quality, Neitas and Freto (2017) decided to use reliability only, Liu and Prybutok (2021) used reliability and flexibility, and Olde Klieverik (2023) removed the security factor from the model. However, Chou (2019) adapted Benlin et al.'s (2011) model to measure service quality for the SaaS-CRM context. Benlin et al.'s (2011) SaaS-Qual model is appropriate to address multiple perspectives of service quality dimensions (Chou, 2019). Thus, this study decided to use this model to measure service quality.

Figure 2.1: Research Model



Source: (Authors' own work)

After measuring the service quality, this study examines its influence on customer satisfaction by testing the hypothesis. Thus, the following hypothesis 'H1' has been developed based on a previous study, which mentioned the satisfaction topic of the relationship between themes and the entire literature analysis.

H1: Service quality positively influences customer satisfaction in the SaaS context of Nepal.

2.5 Chapter Summary

In addition to the existing literature on service quality and customer satisfaction, this study delivers new insight from the sector which has not been addressed earlier, for example SaaS context of Nepal. Before this research, the sector was mainly involved in studies of developed countries. For example, Bhattacherjee (2001) took samples from the United States, Benlin et al. (2011) researched Germany's context, Yang and Lin (2015) were from Taiwan, and Olde Klieverik (2023) studied in the Netherlands. The article by Parasuraman et al. (1988) develops a foundational framework for many recent research studies which share a commonality to focus on a B2C instead of a B2B relationship. Freitas and Neto (2017) criticised the previous SERVQUAL framework because it was focused on the B2C SaaS environment, whereas the SaaS-Qual model of Benlin et al. (2011) is indeed relevant because of the B2B business context. Accordingly, Pragati IT Solution, Nepal's IMS software serving educational institutions and thus operating in a B2B environment, enables the use of the SaaS-Qual model.

Another main difference in prior studies (Benlian et al., 2011; Freitas & Neto, 2017; Chou, 2019) and this study is the sample representation, where previous researches are mainly focused on sampling extracted from databases of large international organisations, whereas this study completely focuses on collecting samples from a specific company's customers. Thus, this study can generate fine, context-rich findings which represent the experiences and expectations of Pragati IT Solution, Nepal's customers, more precisely.

Chapter 3

3.1 Chapter Overview

This chapter begins with a critical review of the research methodologies adopted to assess service quality and customer satisfaction, with a particular focus on the context of Software as a Service (SaaS). This chapter aims to establish a foundation research methodology to achieve the objective of the study, such as to critically identify the key performance dimension of service quality, to critically evaluate the level of customer satisfaction, to critically analyze the relationship between service quality and customer satisfaction, and to provide appropriate recommendations to Pragati IT Solution, Nepal regarding service quality and customer satisfaction in the local SaaS context.

Furthermore, components of the Research Onion Model of Saunders et al. (2023), such as the Research Philosophy, Approach, Strategy, Method and Choice, and Time Horizon components, are presented in separate sections. In each section, relevant literatures are critically reviewed to select each methodology component logically justified and completely aligned with the research objective.

The next section focuses on research techniques and procedures, such as data collection methods and instruments, data analysis methods and techniques, sampling strategy, validation, etc. In this section, the literature regarding the data extraction, transformation, and analysis process is critically reviewed to decide to select appropriate data collection and analysis methods and tools.

This section is allocated for ethical consideration to ensure participants' data protection, research integrity, compliance with the ethical guidelines of Ulster University (2018), developing transparency and accountability, and addressing other potential risks.

Finally, the last section provides an overall chapter summary with the selected research onion framework of Saunders et al. (2023) components for this study. Furthermore, this section also presents the data collection, manipulation and analysis strategies for the further process of this research.

3.2 Research Philosophy

Research philosophy is the set of beliefs and assumptions about how knowledge is created, developed and understood in research (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Based on the literature on service quality and customer satisfaction, which is mentioned in appendix 3.1, almost all of the studies followed the positivist research philosophy (Parasuramana et al., 1985; Parasuraman et al., 1988; Bhattacherjee, 2001; Benlian et al., 2010; Benlian et al., 2011; Freitas and Freitas Neto, 2017; Chou, 2019; Liu and Prybutok, 2020; Olde Klieverik, 2023) which assumes that reality is an objective, which is stable, and can be measured through observation in quantifiable phenomena (Saunders et al., 2023). Although interpretivism focuses on understanding human experiences, meanings and social phenomena, which assumes reality is socially constructed rather than objective (Dr. Hannes Nel, D. Com and D. Phil, 2019), pragmatism focuses on practical solutions (Kaushik and Walsh, 2019), the positivism assumes that reality exists objectively and can be observed and measured through empirical observations and experiments (Saunders et al., 2023). Interpretivism and pragmatism were unsuitable for this research because the goal is to measure the relationship between predefined dimensions of service quality and customer satisfaction using quantitative data, whereas positivism is the appropriate choice for this study. After all, this philosophy allows hypothesis testing through statistical analysis and believes that the generalisations are developed through measurable observation (Benlian et al., 2011; Saunders et al., 2023). Thus, this study followed a positivist research philosophy. As the company aims to expand internationally by developing a data-driven understanding of service quality dimensions and their impacts on customer satisfaction, to introduce a benchmark for internal expansion strategies (Neupane, 2018).

3.3 Research Approach

The research approach is the plan for how researchers move from broad philosophy to specific data collection and analysis (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Based on the reviewed literature and summary provided on Appendix 3.1, most of the studies adopt a deductive approach to theory development, which begins from pre-established theories or hypotheses and then tests them through empirical data (Parasuramana et al., 1985; Parasuraman et

al., 1988; Bhattacherjee, 2001; Benlian et al., 2010; Chou, 2019; Liu and Prybutok, 2020; Olde Klieverik, 2023; Saunders et al., 2023), whereas Benlian et al. (2011), Freitas and Freitas Neto (2017), adopted mixed method with deductive and inductive research approach to first experiments and test hypotheses with preexisting model with quantitatively statistical methods and then improve model and parameters with qualitative observation. The inductive approach was not suitable for this study because it focuses on generating a theory from observed data, which is appropriate for exploratory studies where limited previous research exists, whereas the abductive approach is only suitable for discovery and conceptual development. Because aimed of this study is to assess service quality and examine its relationship with customer satisfaction of Pragati IT Solution, Nepal, in the Nepalese SaaS context; thus, a deductive approach was adopted for the study as it allows for the objective measurement of user perceptions and statistically tests a generalizable relationship with satisfaction relevant to the company's SaaS offering in Nepalese educational institutions (Parasuramana et al., 1985; Parasuraman et al., 1988; Bhattacherjee, 2001; Benlian et al., 2010; Chou, 2019; Liu and Prybutok, 2020; Olde Klieverik, 2023; Saunders et al., 2023).

3.4 Research Strategy

Research strategy is the overall plan or roadmap to answer the research question (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). The most common research strategy is a survey, based on previous literature studies' summary listed in Appendix 3.1, which provide statistically measurable quantitative data; however, other studies mix their strategy with survey research strategies, eg, model development (Parasuramana et al., 1985; Benlian et al., 2011), scale development (Parasuraman et al., 1988), field study (Bhattacherjee, 2001; Benlian et al., 2010), empirical study (Liu and Prybutok, 2020) and applied case study (Olde Klieverik, 2023). Although this study has collected data from a single company, the research strategy is not a pure case study because a case study requires in-depth qualitative evidence (Bryman, 2016; Saunders et al., 2023). An archival research strategy is not appropriate for this study because it focuses on secondary data, but this research collects primary data (Saunders et al., 2023). This research adopted a survey-based strategy, which allows for the collection large volume of quantitative data in minimal time and resources to measure variables and impacts, understanding patterns, and statistical relationships between different variables, such as service quality and customer satisfaction (Al-

Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). In this research study, a well-structured questionnaire was provided to the MIS users, especially the contact persons who are appointed from user companies to contact the service provider, that is, Pragati IT Solution, Nepal, to ensure smooth operation and problem-solving via an online medium, and responses were collected in the same way. This strategy is easy to administer, efficient, and aligns well with a deductive approach and positivist philosophy. Furthermore, survey-based data can be analysed statistically, and the results can be generalised in a similar context (Saunders et al., 2023).

3.5 Methodological Choice

Methodological choice refers to the stage of the research plan where a researcher needs to decide what kind of data should be collected and analyzed (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Parasuramana et al. (1985) pursued a mono-method qualitative conceptual approach to develop the conceptual framework for the SERVQUAL model. However, Parasuraman et al. (1988) further developed and tested a multi-scale conceptual framework with mixing quantitative and qualitative data by using a mixed-method single design. After that, multiple practitioners followed the mono-method quantitative approach to research and test hypotheses regarding service quality and customer satisfaction, such as Bhattacherjee (2001), Benlian et al. (2010), Chou (2019), and Liu and Prybutok (2020). On the other side, Benlian et al. (2011), Freitas and Freitas Neto (2017), and Olde Klieverik (2023) used a mixed-method with quantitative and qualitative responses, where model refinement was made through qualitative responses such as case study, interviews, focus group and card sorting exercise and hypotheses were tested through survey responses. Finally, this study followed a quantitative mono-method for methodological choice because this study is designed to solely collect structured survey data. This method is straightforward, less time-consuming and very practical for a university dissertation, whereas, qualitative mono method only deals with qualitative responses and analysis, and mixed-method takes a long time and resources to complete the study, but this study's objective is to test the SaaS-Qual model of Benlian et al. (2011) in the Nepalese SaaS environment. It provides an efficient data collection method, easy comparison of responses, and performs statistical analysis to test the relationship between service quality and customer satisfaction of Pragati IT Solution,

Nepal. This approach also ensures clarity and consistency during data collection, making it appropriate for academic research (Saunders et al., 2023).

3.6 Time Horizon

Time horizon refers to the timeframe over which data would be collected (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Based on the previous literature mentioned in Appendix 3.1, all of the researchers such as Parasuramana et al. (1985), Parasuraman et al. (1988), Bhattacherjee (2001), Benlian et al. (2010), Benlian et al. (2011), Freitas and Freitas Neto (2017), Chou (2019), Liu and Prybutok (2020), Olde Klieverik (2023) adopted cross-sectional time horizon for data collection, where responses were collected at a single point in time; however Research Onion Model of Saunders et al. (2023) suggests that the longitudinal time horizon approach is suitable for long-term trends and development. However, this study adopted a cross-sectional time horizon, where data is collected at a single point in time as a quick snapshot. This approach is efficient and appropriate for collecting current data to understand the present relationship between service quality and customer satisfaction among SaaS users of Pragati IT Solution, Nepal. It allows for timely data collection without tedious and long-term follow-ups, which makes this approach efficient, less time-consuming and more practical for deductive research (Saunders et al., 2023).

3.7 Research Techniques and Procedures

3.7.1 Data Collection Methods and Tools

Data collection methods or tools refer to instruments used for gathering data (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). The most widely adopted data collection instrument for the service quality and customer satisfaction sector is a survey questionnaire, which is solely used by Bhattacherjee (2001), Benlian et al. (2010), Chou (2019), and Liu and Prybutok (2020), where this instrument collects data from people about what they think, feel or do, usually using a questionnaire (Saunders et al., 2023). Similarly, Parasuraman et al. (1988), Benlian et al. (2011), and Olde Klieverik (2023) used survey questionnaires with mixing other instruments such

as focus groups, interviews, factor analysis, literature review, experiment, and card sorting. Whereas Parasuramana et al. (1985) and Freitas and Freitas Neto (2017) used archival research instead of survey questionnaires.

Different data collection strategies were evaluated in the methodological choice section and survey strategy appeared best fit for this study to collects primary quantitative survey data, and 30 survey items were finalized in (Appendix 3.4) based on the SaaS Qual model (Benlian et al. 2011) outlined in Appendix 3.3, which is a widely accepted and validated model to study service quality and customer satisfaction in the SaaS environment. This instrument measures service quality through key dimensions: reliability, responsiveness, rapport, flexibility, security, and features. The survey questionnaire comprises closed-ended statements and measures on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to convert responses of Pragati IT Solution's SaaS users into a quantitative form, and the survey was conducted via online platforms. Additionally, some demographic information and level of overall customer satisfaction (Appendix 3.5) data were also collected for further statistical analysis and hypothesis testing.

Similarly, sampling is an important strategy for this study, which refers to the selection of fewer participants from a large population (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Pragati IT Solution, Nepal, have 2000 B2B users across Nepal (Neupane, 2018), and this study's aim was to select 150 sample participants from the total population. According to Chou (2019) and Liu and Prybutok (2020), convenience sampling is a common practice in IS and consumer cloud research. However, Olde Klieverik (2023) used a purposive case study sampling method because of the case study logic of selecting participants most likely to illuminate the phenomenon.

Probability simple random sampling provides an equal chance to participate, which reduces bias (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Probability stratified sampling ensures proportional representation of different categorical contexts (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). However, due to limited access to the participants, time constraints, and limited resources, this study employed a non-probability, haphazard convenience sampling method, specifically targeting B2B users of Pragati IT Solution who operate in a particular location in Nepal. The location had been chosen based on accessibility and personal

networking to ensure smooth data collection in a short period. Figure 3.1 presents the different sampling methods and highlights the selected sampling method for this study.

Figure 3.1: Overview of sampling procedure

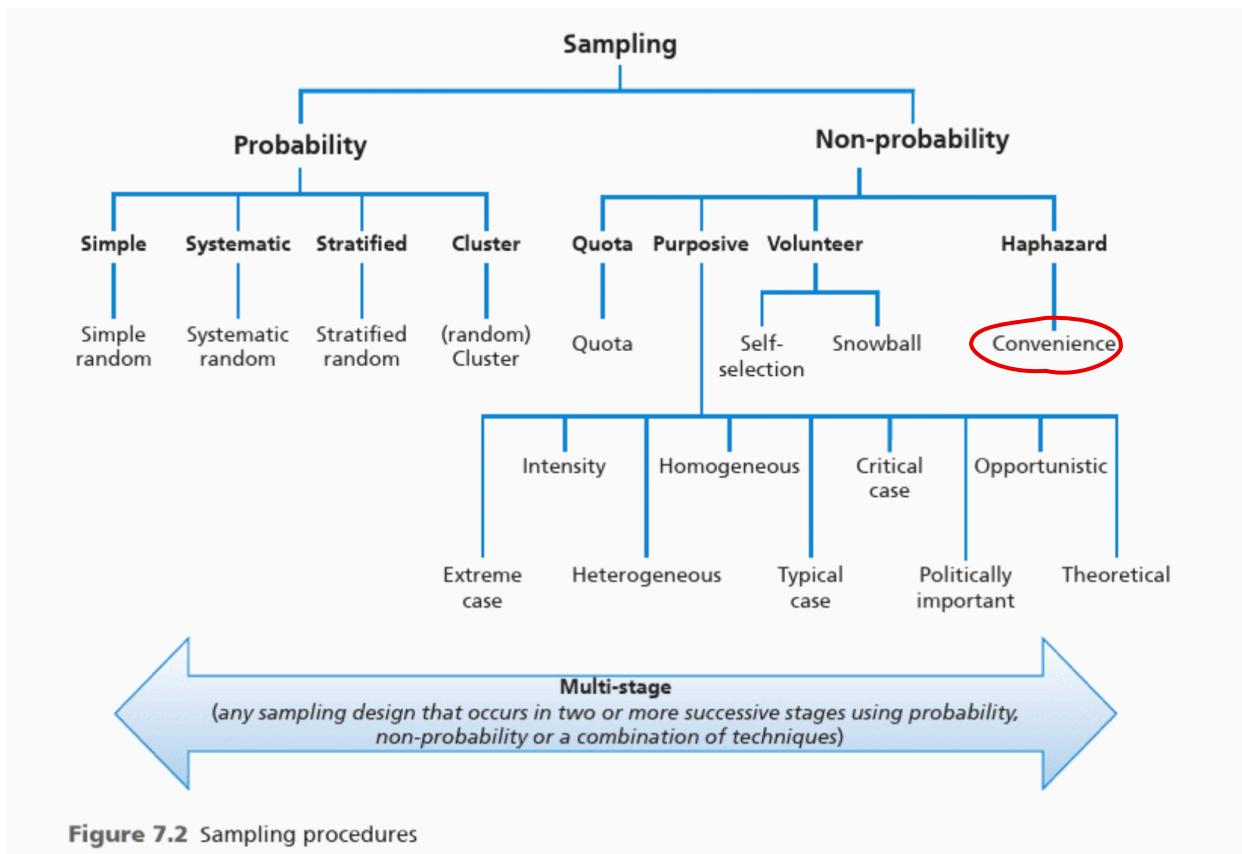


Figure 7.2 Sampling procedures

Source (Saunders, Lewis and Thornhill, 2023, p. 293)

3.7.2 Data Analysis Methods and Tools

Data analysis methods and tools are a process of examining, interpreting and making sense of the data (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Firstly, survey data was collected in two parts, one collected demographic responses, and the other was in five five-point Likert scales as ordinal data. To analyse the survey data, the collected data were validated by performing data validation techniques such as checking format, range, consistency, uniqueness and required fields (Pallant, 2020). The dataset was summarised to understand the descriptive statistics of the respondents' perception regarding service quality dimensions. Mean, median,

mode, and standard deviation were calculated to understand an overview of central tendencies and variation within the dataset (Field, 2018). Principal Component Analysis (PCA) was performed to find out the component contribution weight. Pearson's correlation coefficient was measured to examine the strength and direction of the bivariate association, and a linear regression model was developed and trained with service quality constructs to predict customer satisfaction. For example, how does the combined construct of the SaaS software service quality of Pragati IT Solution affect their customer satisfaction?

Controlling measures were taken to control potential confounding variables. This approach aligned with established empirical studies in the service quality literature (Parasuraman et al., 1988; Lederer et al., 2013; Benlian et al., 2011).

On top of that, to ensure validity, this study adopted the SaaS Qual framework as an established instrument, which was empirically validated in other similar contexts (Benlian et al., 2011). This framework covers key dimensions of the cloud computing sector, including reliability, responsiveness, rapport, security, features, and flexibility, which helps to ensure strong content and construct validity. Similarly, these survey items were adapted meaningfully in the context of Pragati IT Solution, Nepal, and regularly compared with both procedures for better validation. To ensure reliability, Internal consistency of the constructs was measured by using Cronbach's Alpha with a threshold of 0.7 or higher to confirm internal reliability (Nunnally & Bernstein, 1994). This process ensures all dimensions of the SaaS Qual model follow the same benchmark.

3.7.3 Ethical Considerations

This research addressed all ethical guidelines of Ulster University (2018), such as informed consent was provided to all participants with detailed information about possible risks, voluntariness, and withdrawal rights. Confidentiality had been maintained during and after the entire research period by anonymising data, storing it securely, adapting digital data protection protocols and complying with GDPR guidelines. Risk assessment had been conducted to enhance the physical and emotional well-being and safety of all participants. Conflict of interest had been minimised during participant selection, data collection, data analysis, and reporting periods. Additionally, ethical approval had been obtained from the university, as outlined in Appendix 3.6.

Furthermore, this study complied UK General Data Protection Regulation (GDPR) and the Data Protection Act 2018.

3.8 Chapter Summary

Research methodology for this study is designed based on the Research Onion model (Saunders et al., 2023), which is presented in Appendix 3.2 by highlighting selected methodologies. This study adopted the quantitative mono-method approach for addressing the research aim and objective effectively. A structured survey dataset of the SaaS-Qual framework allows for proper measurement of the service quality dimension and customer satisfaction. This approach was based on positivist philosophy and deductive reasoning. Additionally, a mono-method quantitative approach is more statistically measurable, comparable, and generalizable. The survey was conducted at a single time point to collect a single time snapshot of responses of Pragati IT Solution, Nepal's customers' attitudes, to critically understand and examine the service quality situation and its influence on overall customer satisfaction.

Chapter 4

4.1 Chapter Overview

The main objective of this chapter is to achieve the research aim, which is to assess service quality and its influence on customer satisfaction in the SaaS context of Pragati IT Solution, Nepal, by answering research questions through the help of quantitative data, which was collected through non-probability convenience sampling. This chapter presents analyses, major findings, multiple graphs, tables, and critically discusses the empirical results derived from responses of 129 sample SaaS Software users of Pragati IT Solution, Nepal and previous literature. The chapter is structured into five different sections.

In the first section, a chapter overview has been presented.

In the second section, key dimensions of service quality construct measurement and validation have been presented. Moreover, findings from descriptive and inferential statistical analysis are presented visually using different tables, charts and graphical figures and interpreted and critically explained what they reveal in the area of SaaS service quality and customer satisfaction in the SaaS context of Pragati IT Solution, Nepal.

In the third section, critical analytics and evaluation of those findings and results are presented, which demonstrate evidence of how service quality influences customer satisfaction among SaaS users at Pragati IT Solution, Nepal.

The final section critically discusses major evidence in relation to existing theories and empirical studies from the literature review to understand what improvements could be recommended to enhance service quality and customer satisfaction for Pragati IT Solution, Nepal and other Nepalese SaaS providers before presenting a brief chapter summary.

4.2 Presentation of Findings, Interpretation, and Critical Analysis

4.2.1 Data Collection

To test the research model and measurement instruments in the context of Pragati IT Solution, Nepal's SaaS service quality and customer satisfaction, this study designed a questionnaire, which is presented in Appendix 3.5, and surveyed with SaaS product users of Pragati IT Solution, Nepal. This paper adopted a non-probability haphazard convenience sampling method and collected 129 responses from 156 approaches, which were sent to the SaaS software users of Pragati IT Solution, Nepal, mainly to the Administrator, IT staff, and other active users via email and collected responses accordingly. The collected survey data has no missing values, errors or other validation issues; thus, all responses were used for further data analysis process. A sample size of 129 respondents provides a stronger empirical foundation for reliability and validity testing of reflective measures (Samuels, 2017; Gunawan, Marzilli and Aungsuroch, 2021). The final dataset for analysis is presented in Appendix 4.1, where personal identifiers are removed for privacy concerns.

4.2.2 Data Analysis

Demographic information about the respondents that has been presented in Table 4.1 with pie charts for better presentation, showed the roles in their organisations, where 37.24% of them were founders or principals of their institutions, 28.68% of administrators and 4.65% vice principals, and a total of 70.54 % respondents were represented from the top and high level decision making roles, which likely influenced the evaluation of overall service quality and its relationship with customer satisfaction. They prioritise strategic dimensions, whereas operational-level users may focus more on usability, support and day-to-day experience (Davis, 1993; Venkatesh et al., 2003). Similarly, 32.56% respondents were using all SaaS modules offered by Pragai IT Solution, Nepal, where 78.29% users were using more than one module simultaneously. This suggests the multi-model approach of SaaS users of Pragati IT Solution, Nepal and the integrated nature of the system and cross-functional functionality, which enhances perceived service value and also indicates the user experience and satisfaction are likely influenced by the overall SaaS Suite (Qasem Ali et al.,

2021). Furthermore, 88.37% respondents had been taking the SaaS services for more than three years, and 89.15% respondents were using it daily. Long-term frequent usage depicts that the users are well known with the functionalities, features and limitations of the SaaS products, which enhances the reliability of collected perception regarding service quality and customer satisfaction of Pragati IT Solution, Nepal. Further demographic characteristics and visual presentation are shown in Table 4.1.

Table 4.1: Sample descriptives for research study with pie charts

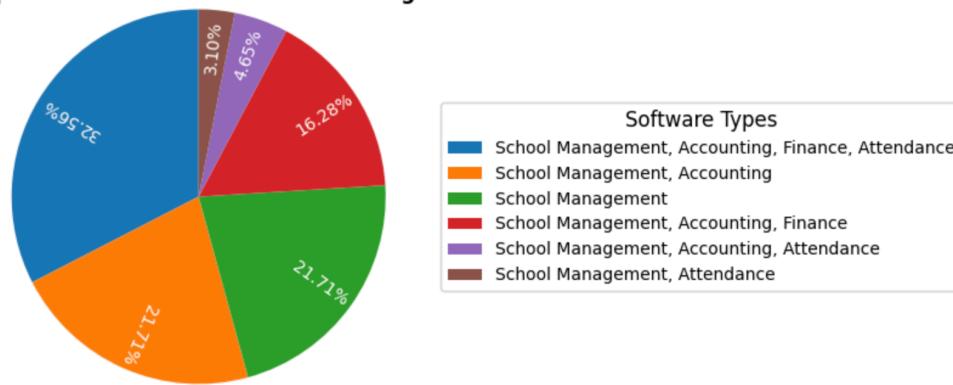
Role of SaaS users	
Department	Percentage
Founder / Principal	37.21%
Administration	28.68%
Account	16.28%
IT	10.08%
Vice Principal	4.65%
Teacher	3.10%

Proportion of Respondents Across Roles	
	<p>Departments</p> <ul style="list-style-type: none"> Founder/ Principal Administration Account IT Vice-principal Teaching

Type of SaaS product Users	
Software Packages	Percentage
School Management, Accounting, Finance, Attendance	32.56%
School Management	21.71%
School Management, Accounting	21.71%
School Management, Accounting, Finance	16.28%

School Management, Accounting, Attendance	4.65%
School Management, Attendance	3.10%

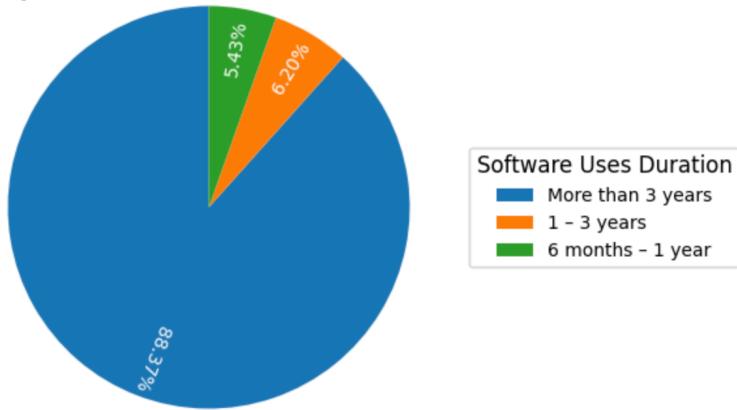
Proportion of Different Software Packages



Type of SaaS product Users

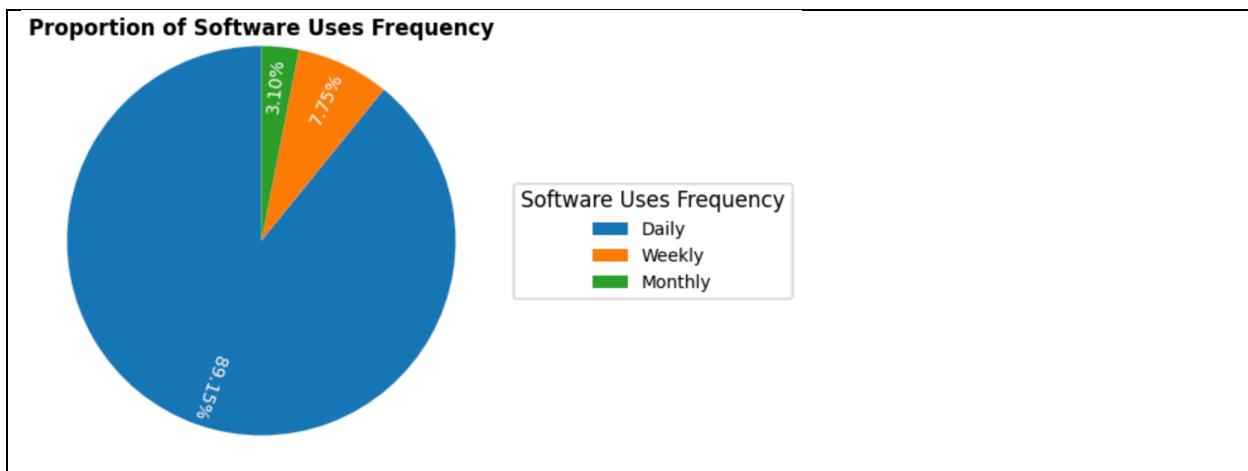
Length of SaaS uses of respondents	Percentage
More than 3 years	88.37%
1 – 3 years	6.20%
Six months – 1 years	5.43%

Proportion of Software Uses Duration



Frequency of SaaS uses of respondents

Software Packages	Percentage
Daily	89.15%
Weekly	7.75%
Monthly	3.10%



Source: (Author's own work and computation using Python 3.12.12)

Similarly, Appendix 4.2 showed the descriptive summary of research questionnaires, where 30 service quality constructs responses and one overall satisfaction response are presented with the total count of responses, the mean value of each question, standard deviation, minimum value, maximum value, and quartile values. Responses to all survey questions were 129, the maximum value was 5 (strongly agree), and the minimum value was 1 (strongly disagree). Further, data validation and analysis are provided in the next section.

4.2.3 Constructs Measurement and Validation

The two constructs of interest in this research model were SaaS service quality (SaaS-Qual) and customer satisfaction, the detail structure is presented in literature review chapter of this study, where SaaS service quality has been measured as a formative second-order construct with six reflective first-order constructs adopted from Benlian et al. (2011) with improvement (see Appendix 3.3 and Appendix 3.4), and although multi-item scales are preferred better for the construct, a single-item measure is also commonly accepted for overall customer satisfaction measurement due to its unidimensional nature and established validity in prior studies (Christophersen and Konradt, 2011); thus, this study decided to adopts single-item scale for customer satisfaction which was measured as single-item construct (Sat) in five Point Likert Scale. Both constructs of interest are presented in Appendix 3.4.

The service quality constructs were Rapport (Ra), Responsiveness (Res), Reliability (Rel), Flexibility (Fl), Features (Fe) and Security (Se), and they were assessed using multi-item scales and responses were collected in a 5 Point Likert Scale (see Appendix 4.1, Appendix 4.2). Collected responses were analysed using Python language with the help of multiple libraries and a detailed calculation flow presented in Appendix 4.3. Based on the calculation, internal consistency reliability was confirmed with Cronbach's Alpha values ranging between 0.706 and 0.849. Similarly, Composite Reliability (CR) values range from 0.814 to 0.9. Both Cronbach's Alpha values and CR values are higher than the recommended threshold of 0.70, which indicates satisfactory reliability of the collected data (Christophersen and Konradt, 2011; Nunnally & Bernstein, 1994). The factor loadings of the indicators (0.55–0.88) are above the acceptable cutoff rate, while the Average Variance Extracted (AVE) values (0.573–0.643) surpass the **0.50**, demonstrating satisfactory convergent validity; however, the responsiveness showed 0.47 AVE, which is slightly below the criterion (Fornell & Larcker, 1981; Hair et al., 2009). In conclusion, despite the slightly lower AVE of responsiveness, these results support the reliability and convergent validity of the measurement model and provide a strong foundation for further structural modelling with a second-order construct. The reliability and convergent validity confirm that examining how service quality affects customer satisfaction analysis can be performed with confidence, and the insights reflect user perceptions of SaaS service quality at Pragati IT Solution, Nepal. Further reflective measurement details are shown in Table 4.2.

Table 4.2: Assessment of reflective measurement models: Loadings and Reliability

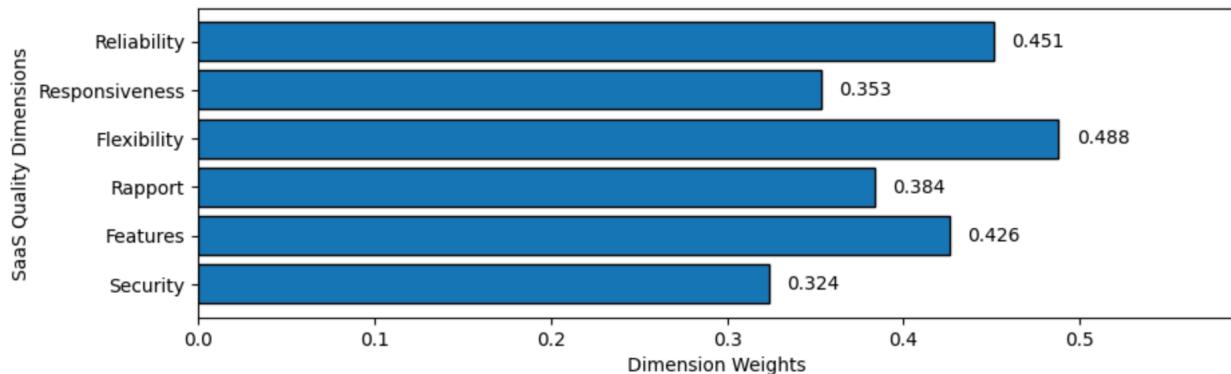
Construct	Indicators	Cronbach's Alpha	Range of Loadings	CR	AVE
Reliability	Rel1, Rel2, Rel3, Rel4, Rel5	0.818	0.64 - 0.88	0.883	0.603
Responsiveness	Res1, Res2, Res3, Res4, Res5	0.706	0.55 - 0.79	0.814	0.47
Flexibility	Fl1, Fl2, Fl3, Fl4, Fl5	0.849	0.76 - 0.84	0.9	0.643
Rapport	Ra1, Ra2, Ra3, Ra4, Ra5	0.784	0.48 - 0.86	0.866	0.573
Features	Fe1, Fe2, Fe3, Fe4, Fe5	0.842	0.74 - 0.86	0.894	0.63
Security	Sec1, Sec2, Sec3, Sec4, Sec5	0.815	0.65 - 0.83	0.873	0.58

Source: (Author's computation using Python 3.12.12)

4.2.4 Assessment of Overall Service Quality

To assess overall service quality. The composite score was calculated from the first-order dimension of the SaaS-Qual model (Reliability, Responsiveness, Flexibility, Rapport, Features, Security), which was conceptualised by Benlian et al. (2011). Firstly, the mean value was calculated for each first-order dimension. Then, the latent factor was extracted by using Principal Component Analysis (PCA) to capture shared variance across all dimensions because PCA is commonly used in the literature to build composite indices for multi-dimensional phenomena, as it reduces dimensionality while retaining maximal information (Mazziotta and Pareto, 2024). This latent factor represents the overall service quality perceived by users (Joseph and Reynaldo, 2025), and it was regressed with the six first-order constructs to obtain empirical weights of each dimension of overall service quality. Finally, the overall service quality score for each respondent was computed as a weighted combination of first-order scores. This method draws on best practices for composite index construction, where weighting is determined empirically rather than arbitrarily (Jimenez Fernandez and Ruiz Martos, 2020).

Figure 4.1 Weighted Contribution of SaaS Quality Dimensions



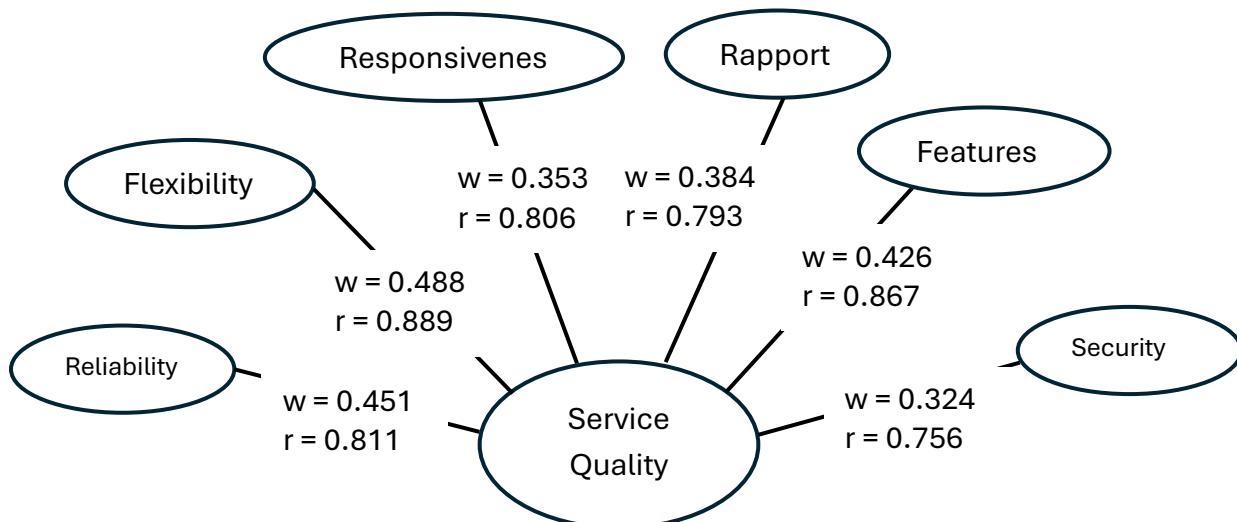
Source: (Author's computation using Python 3.12.12)

Figure 4.1 illustrates the bar chart of regression-based relative contribution, where how respondents perceive the SaaS product across all six quality dimensions (regression weights, w), and Figure 4.2 Second-order construct result & Table 4.4 Correlation matrix of constructs illustrate the strength of association (correlation coefficients, r), relative influence of the six first-order

constructs on overall SaaS service quality. Flexibility (weight = 0.488; $r = 0.889$), Reliability (weight = 0.451; $r = 0.811$), and Features (weight = 0.4.26; $r = 0.867$) are the most influential dimensions, which indicates that users prioritise system adaptability and consistent performance when evaluating overall service quality. This pattern aligns with the IS service quality theory that emphasises the tech-intensive contexts, where functional quality attributes, for example, flexibility, reliability and features strongly influence user evaluation rather than relational qualities (Pitt et al., 1995; Barki, Rivard and Talbot, 2001; Delone and McLean, 2003). In the SaaS context, software is used daily (see Table 4.1) for core business operations, where users place greater weight on whether software performs consistently, helps to achieve organisational needs, and delivers desired features. Thus, system performance-related attributes dominate overall service quality measurement.

Moreover, Responsiveness (weight = 0.353; $r = 0.806$) contribute moderately, while Rapport (weight = 0.384; $r = 0.793$) and Security (weight = 0.324; $r = 0.756$) have lower but still meaningful impacts. In conclusion, using both regression-based weights and correlation coefficients delivers a robust interpretation of construct influence because weights capture unique contribution, whereas correlations provide overall association. According to Hair et al. (2019), this approach aligns with multidimensional service quality modelling practices. Overall, the results highlight that functional quality dimensions dominate users' perception of SaaS service quality, while relational and security aspects, though relevant, play a relatively smaller role (Benlian et al., 2011).

Figure 4.2: Second-order construct result



Source: (Author's own work and computation using Python 3.12.12)

4.2.5 Correlation Analysis

The correlation matrix table of constructs, i.e. Table 4.3, has almost all of have positive values except the correlation between rapport and satisfaction, which indicates that a high value on one factor does not produce a high value on another (Benlian et al., 2011). Additionally, this analysis shows that while overall SaaS service quality (SaaS_Qual_Weighted) is positively perceived, it exhibits only a weak association with user satisfaction ($r = 0.111$). Among individual dimensions, Security ($r = 0.190$) and Features ($r = 0.163$) show the strongest, though still lower-level correlations with satisfaction. Other dimensions, including Reliability, Responsiveness, and Flexibility, have positive and Rapport has negative, but negligible associations. These findings suggest that although functional and relational service quality dimensions are important for shaping perceptions of overall service quality, they alone may not fully determine user satisfaction. Additional factors, such as usability, cost, or expectations, likely play a significant role, highlighting the need to examine mediators or contextual variables in SaaS satisfaction research of Pragati IT Solution, Nepal (Benlian et al., 2011; Delone and McLean, 2003).

Table 4.3: Correlation matrix of constructs

	Reliability	Responsiveness	Flexibility	Rapport	Features	Security	SaaS_Qual_Weighted	Satisfaction
Reliability	1.000							
Responsiveness	0.542***	1.000						
Flexibility	0.630***	0.704***	1.000					
Rapport	0.601***	0.532***	0.653***	1.000				
Features	0.586***	0.692***	0.706**	0.642***	1.000			
Security	0.528***	0.602***	0.608***	0.469***	0.681***	1.000		
SaaS_Qual_Weighted	0.811***	0.806***	0.889***	0.793***	0.867***	0.756***	1.000	
Satisfaction	0.117	0.055	0.122	-0.111	0.163	0.190*	0.111	1.000

Source: (Author's computation using Python 3.12.12)

4.2.6 Hypotheses Testing

Figure 4.3 depicts the entire research model with the first-order construct weight on overall service quality, the correlation coefficient of overall service quality and customer satisfaction, the variance

in customer satisfaction R^2 , and the Variance Inflation Factor (VIF). Regression analysis shows that the six first-order service quality dimensions collectively explain approximately 15.21% of the variance in customer satisfaction ($R^2 = 0.1521$), whereas the overall weighted service quality score explains only 1.22% ($R^2 = 0.0122$).

Figure 4.3 Structural Model Results



Source: (Author's own work and computation using Python 3.12.12)

Hypothesis H1 proposed that service quality positively influences customer satisfaction among SaaS users at Pragati IT Solution, Nepal. The analysis shows a weak positive association between the overall weighted service quality and satisfaction (correlation (r) = 0.111, coefficient of determination (R^2) = 0.0122), while the first-order constructs collectively explain only 15.21% of the variance in satisfaction ($R^2 = 0.1521$), which demonstrates some predictive power in the construct level. However, most of the individual predictors are not statistically significant, whereas Rapport exhibits a significant negative effect ($\beta = -0.543$, $p < 0.001$), contrary to theoretical expectations. Surprisingly, dimensions that theory often predicts as positively associated with satisfaction, such as reliability, responsiveness, flexibility, features, and security, do not reach conventional significance levels. On top of that, the model contains extremely high multicollinearity (VIF values > 100 (see figure 4.3)), which limits the interpretability of the individual regression coefficients because multicollinearity implies that the service quality dimensions overlaps strongly and functions more as a combined package rather than as an

independent variable of satisfaction (O'Brien, 2007; Vatcheva and Lee, 2016; Marcoulides and Raykov, 2019). These findings indicate that, although higher perceived service quality is associated with greater satisfaction, the effect is modest. It suggests that other factors beyond service quality may significantly influence customer satisfaction in the SaaS context of Pragati IT Solution, Nepal.

All calculations were performed using Python's statistical libraries, and the full analysis workflow is provided in Appendix 4.3 through the accompanying Python notebook.

4.3 Critical Discussion of Major Findings

A sample size of 129 respondents was collected from a 2000 population size, which allows a sampling error of approximately $\pm 9\%$. According to the standard formula for sample size and margin of error calculation, this sample size delivers a 90% confidence level (Dawkins, 2025). Although a 90% confidence level ($\alpha = 0.10$) is acceptable in exploratory social science research, the most common practice is to use a 95% confidence level ($\alpha = 0.05$), where a larger sample size, approximately 384 responses, is preferable for greater precision(Dawkins, 2025). This sample contains potential sampling error and bias because convenient sampling does not provide an equal chance of selection and may not properly represent the entire population(Musa and Alkassim, 2016; Saunders et al., 2023; Etikan). However, a convenience sample is a common and acceptable practice in service quality and customer satisfaction research (Parasuramana et al., 1985; Parasuraman et al., 1988; Bhattacherjee, 2001; Benlian et al., 2010; Benlian et al., 2011; Freitas and Freitas Neto, 2017; Chou, 2019; Liu and Prybutok, 2020; Olde Klieverik, 2023).

Demographic analysis revealed a higher proportion of respondents (70.54%) from top-level roles, who possess a comprehensive understanding of the entire organisational SaaS application and its performance. However, this concentration can skew findings towards a managerial viewpoint rather than the whole user experience, but this phenomenon is common in SaaS-Qual research; for example, Benlian et al. (2011) 's sample had 57% executives, and Yang et al. (2015)' sample represented 67.7% of directors, CEOs, and Managers. Furthermore, more than two-thirds of

respondents were using multiple SaaS software offered by Pragati IT Solution, Nepal. Similarly, 88.73% participants were using those SaaS ecosystems for more than three years, and almost 90% respondents were using them daily. which clearly represents the high level of engagement and trust with Pragati IT Solution, Nepal and its SaaS products.

While the measurement model demonstrated acceptable reliability and validity for the SaaS service quality of Pragati IT Solution, Nepal, whereas AVE of responsiveness (0.47) was slightly lower, which suggests this dimension may not capture user perspectives effectively. This outcome aligns with the study of Freitas and Freitas Neto (2017), who published a paper on SaaS service quality from the customer's perspective and found that the functional and reliability aspects are more influential than other dimensions from Benlian et al.'s (2011) SaaS Qual model. However, Benlian et al. (2011) validated the six-dimensional SaaS Qual framework in the SaaS context of Germany, and this study extends the context to a Nepalese organisational setting. Thus, some variation might affect in perceived importance, like responsiveness in the Nepalese context. Additionally, while measuring overall customer satisfaction based on a single-item measure is theoretically justified (Christophersen and Konradt, 2011), it may overlook other dimensions of customer satisfaction which might be captured by multi-item scales.

The assessment of SaaS service quality of Pragati IT Solution, Nepal, reveals the prioritisation of functional dimensions such as flexibility, reliability, and features, which employ the strongest influence on users' perceptions as indicated by both regression-based weights and correlation coefficients. This pattern is consistent with established Information System (IS) service quality theory, where technology-intensive contexts often prioritise functional attributes over relational and security-based aspects (Pitt et al., 1995; Barki, Rivard and Talbot, 2001; Delone and McLean, 2003). In contrast, responsiveness, rapport, and security still contribute meaningfully, although their regression-based weights and correlation coefficients are lower, which indicates the system performance and adaptability over interpersonal support and security measures. Comperatively, Benlian et. al. (2011) found that the strongest predictors of SaaS satisfaction are responsiveness and security rather than functional attributes such as reliability, flexibility and features, which emphasise the performance and security over interpersonal support and adaptability. Thus, these contradictory findings suggest that all six dimensions together play a meaningful role in assessing

overall service quality rather than any single dimension. Methodologically, using Principal Component Analysis (PCA) to derive latent factors and regression-based weights is the best practice in composite index construction, which offers a more empirically grounded assessment than an arbitrary weighting scheme (Jimenez Fernandez and Ruiz Martos, 2020; Mazziotta and Pareto, 2024; Joseph and Reynaldo, 2025). Overall, these findings underscore that in the organisational SaaS context of Pragati IT Solution, Nepal, service quality perceptions are largely shaped by functional or operational effectiveness (such as reliability, flexibility and features), with relational and security (such as responsiveness, rapport and security) dimensions also playing a crucial and strong secondary role.

The correlation analysis reveals that most of the dimensions showed only a weak or negligible relationship with satisfaction, where security ($r = 0.190$) and features ($r = 0.163$) are the strongest, but still show a modest association. Based on existing literature synthesis and real-world practice rapport ($r = -0.111$), the negative relationship between rapport and customer satisfaction does not imply that stronger rapport reduces satisfaction; rather, it suggests that the way rapport is currently experienced, which often occurs during issue resolution or is misaligned with user expectations, fails to contribute positively to satisfaction in this context (Gremler and Gwinner, 2000). This contrasts with previous SaaS quality studies, where non-functional dimensions such as responsiveness, reliability and security had shown strong predictive power for satisfaction. For instance, Benlian et al. (2011) found that responsiveness, reliability and rapport had a significant positive effect on satisfaction, which suggests that their sample was more sensitive to performance and timely support than those at Pragati IT Solution. Delone and McLean's (2003) IS success model emphasises the central role of system quality and service quality as key drivers of satisfaction. Although literature suggests service quality strongly influences satisfaction, in this study it had minimal impact. Delone and McLean's (2003) model, which includes additional factors, shows stronger predictive power but was not applied here.. One potential explanation of these contextual factors, such as organisational expectation, cost structures, available alternatives, pre-existing vendor relationship, and dependency condition with the existing system, may dilute the direct influence of service quality dimensions within the Nepalese SaaS environment. Moreover, the negative and negligible correlation between rapport and satisfaction challenges the findings from studies emphasising the importance of relational quality in IT service contexts (e.g.,

Benlian et al., 2011; Chou and Chiang, 2013; Chou, 2019; Olde Klieverik, 2023), which indicates that the interpersonal factors may be less relevant in SaaS adaptation for this particular case. Overall, the weaker correlation observed here suggests that Pragati IT Solution, Nepal's users, may base their satisfaction on broader strategic and operational considerations rather than traditional SaaS-Qual dimensions. These correlation findings suggest the need for further exploration of potential mediators such as usability, available alternatives, switching cost, trust, dependency, and organisational digital maturity.

Hypothesis H1 proposed that service quality positively influences customer satisfaction among SaaS users at Pragati IT Solution, Nepal. The regression results show that the six first-order service quality dimensions collectively explain only 15.21% of the variance in satisfaction ($R^2 = 0.1521$), while the overall weighted service quality score explains a mere 1.22% ($R^2 = 0.0122$). Critically, these low R^2 values indicate that service quality, though conceptually important, accounts for only a small portion of user satisfaction. This suggests that other unmeasured factors likely play a larger role in shaping satisfaction, consistent with Delone and McLean (2003), which emphasises that satisfaction arises from multiple interrelated constructs, not service quality alone. Compared to prior SaaS research (Benlian et al., 2011), where functional and relational quality dimensions explained more substantial variance in satisfaction, the current findings suggest that the predictive power of service quality may be highly context-dependent. Overall, H1 receives only weak support, and the low R^2 underscores the necessity of including additional mediators or moderators in models of SaaS satisfaction.

4.4 Linking with Literature Review

The findings of this study provide nuanced insights into SaaS service quality and its influence on customer satisfaction in the organisational context of Pragati IT Solution, Nepal. Overall, the results indicate that while service quality is positively associated with satisfaction, its explanatory power is limited by the correlation of overall service quality with customer satisfaction score is 0.111 only, whereas studies of Bhattacherjee (2001), Benlian et al. (2011), and Freitas and Freitas Neto (2017), SaaS service quality and customer satisfaction have a strong positive correlation with

scores of 0.525, 0.513, and 0.827, respectively. This suggests that the SaaS users' satisfaction dimensions vary from developed countries to underdeveloped countries like Nepal.

The IS success model, Delone and McLean (2003) argue that the overall service quality model cannot capture all dimensions of customer satisfaction, which suggests multiple interrelated constructs such as system quality, information quality, service quality, use, and net benefits. In the context of Pragati IT Solution, Nepal or Nepalese SaaS environment, the SaaS-Qual model of Benlian et al. (2011) alone may be insufficient to explain customer satisfaction, which was strongly applicable in the developed countries.

'Assessing the service quality in Software-as-a-Service (SaaS) from the customers' perspective: methodological approach and case of use' by Freitas and Freitas Neto (2017). This study revisits SaaS-Qual from the customer perspective and reports that functional aspects such as reliability and system performance are the most influential constructs for satisfaction. Similarly, a study of Liu, X. and Prybutok, V.R. (2020) on the topic of 'an empirical investigation of factors that drive a user decision to continue using cloud storage services' emphasises functional aspects such as reliability and flexibility often carry more weight than the original six dimensions, which resonates with this study's findings of strong functional-dimension influence. In contrast, although Chou and Chiang (2013), Freitas and Neto (2017), Liu and Prybutok (2021), Basiran and Yusof (2021), and Olde Kliverik (2023) excluded security factors by arguing that security is the service provider's subject and end users have not reached security matters, this study's findings suggest that security is the one of the most important construct for customer satisfaction.

4.5 Chapter Summary

This chapter aimed to answer all the research questions by collecting, analysing, interpreting, and comparing through sample data. Empirical findings on service quality and customer satisfaction in the SaaS context of Pragati IT Solution, Nepal, were presented through a critical analysis of quantitative sample data. In this chapter, a total of 129 responses were analysed, which provides approximately a 90% confidence level. This level of confidence is widely accepted in empirical

research. Furthermore, the demographic data analysis showed a high proportion of managerial respondents and long-term daily users of SaaS products.

The measurement model demonstrated acceptable reliability and validity across most SaaS-Qual dimensions. The assessment of overall service quality revealed that functional attributes, flexibility, reliability and features are the strongest contributors to users' perceptions; however, other constructs also deliver significant contributions to users' perceptions. Thus, they also can not be ignored.

Correlation analysis showed that most service quality dimensions had weak associations with satisfaction, where security and features showed the highest but still modest correlations, and rapport showed a negative relationship. These results deviate from prior SaaS studies, where functional and relational dimensions significantly predicted satisfaction, but in the Pragati IT Solution context, may be shaped by broader organisational, economic or relational dependencies not captured within the SaaS-Qual model (Good, Mangus and Ellen Bolman Pullins, 2023).

Hypothesis testing further indicated weak support for H1. Although service quality positively influenced customer satisfaction, the predictive power was limited to the six first-order dimensions. Multicollinearity among the service quality dimensions was extremely high, which restricted the interpretability of individual predictors. Compared with previous literature findings, these results highlight that service quality alone is insufficient to fully explain customer satisfaction in the Nepalese organisational setting.

Overall, this chapter demonstrates that while Pragati IT solution delivers strong functional service quality, its impact on customer satisfaction is relatively modest. Satisfaction appears to be influenced by additional contextual or organisational factors not included in the current model. These findings point to the need for further investigation into mediators and moderators such as usability, cost-benefit perceptions, switching cost, trust, and digital maturity, to comprehensively explain satisfaction in SaaS environments.

Chapter 5

5.1 Research Summary

This study investigates the influence of service quality on customer satisfaction within the SaaS context of Pragati IT Solution, Nepal, using a structured methodological framework guided by Sunders et al.'s (2023) Research Onion. Grounded in a positivist philosophy, the research assumes that service quality and satisfaction are objective, which can be measured for empirical assessment. A deductive approach is adopted, which represents well-established theories such as SERVQUAL (Parasuraman et al., 1988), IS Success (Delone & McLean, 2003), and SaaS-Qual (Benlian et al., 2011) to test predefined hypotheses. A survey strategy and mono-method quantitative design were employed by using a validated SaaS-Qual-Based questionnaire to collect primary data from B2B users of Pragati IT Solution. Non-probability convenience sampling was used to obtain responses from accessible participants within the organisation's user base. Data was analysed using descriptive statistics, reliability testing, PCA, correlation, and regression to examine how service quality dimensions explain customer satisfaction. The ethical procedure, such as informed consent, anonymity, data protection, adherence to ethical guidelines of Ulster University (2018) and UK GDPR guidelines, ensures the integrity and safety of the research. Overall, this methodology provides a structured, valid and reliable foundation for examining service quality performance and its effect on customer satisfaction in Nepal's SaaS environment.

5.2 Conclusions

This study aimed to assess service quality and examine its influence on customer satisfaction SaaS context of Pragati IT solution, Nepal. The findings provide several key conclusions aligned with the research questions, objective and hypotheses.

Firstly, The first objective of the study was to critically identify the key performance dimension of service quality as perceived by end users of Pragati IT Solution, Nepal. the research successfully identified and validated key dimensions of service quality related to the SaaS environment of Nepal, such as rapport, responsiveness, reliability, flexibility, features and security. Those

dimensions are consistent with the validated SaaS Qual model developed by Benlian et al. (2011), which shows strong theoretical ground (Parasuramana et al., 1985; Parasuraman et al., 1988; Bhattacherjee, 2001; Benlian et al., 2010; Chou, 2019; Liu and Prybutok, 2020; Olde Klieverik, 2023; Saunders et al., 2023). The measurement model results further confirmed their reliability and validity, indicating that each dimension contributes meaningfully to the overall construct of service quality within Pragati IT Solution. This demonstrates that the SaaS-QUAL framework is applicable and appropriate for evaluating SaaS service quality in the Nepalese organisational context.

Secondly, the second objective of this study was to critically analyse the relationship between service quality and customer satisfaction. The findings showed that while identified SaaS-Qual dimensions are relevant and valid for assessing service quality in the Nepalese SaaS context, their influence on customer satisfaction at Pragati IT Solution, Nepal, is positive but relatively weak. Despite the functional attributes, such as reliability, flexibility, and security, being most valued by the users of Pragati IT Solutions, Nepal, these constructs did not translate into strong predictive power for satisfaction in the SaaS context of Pragati IT Solutions, Nepal.

Finally, the final objective of this study was to provide critical recommendations for Pragati IT Solution, Nepal and other Nepalese SaaS providers to enhance service quality and improve customer satisfaction. Based on the findings of this study, to enhance service quality and customer satisfaction, Pragati IT Solution, Nepal, or other Nepalese SaaS providers should prioritise improvements across functional and relational dimensions. First, responsiveness should be a major focus because of its low AVE and weak association with customer satisfaction, which indicates a gap in perceived support efficiency (Cheung et al., 2023). This gap can be improved by enhancing the capacity of helpdesks, reducing ticket resolution times, and offering proactive communication during system issues (Delone and McLean, 2003). Second, features and flexibility are the strongest contributors to perceived service quality. So, enhancing feature richness and system flexibility would reinforce functional performance and better align software capabilities with diverse organisational needs (Pitt et al., 1995; Barki, Rivard and Talbot, 2001; Delone and McLean, 2003). Third, strengthening security protocols and clear communication to end-users may help to build trust, particularly in the context where security has the highest correlation with customer

satisfaction among all six dimensions (Amin and Salim, 2025). Fourth, relational aspects such as rapport should be improved through dedicated support managers, periodic user feedback analysis and customised training to address the negative relationship between rapport and customer satisfaction (Good, Mangus and Ellen Bolman Pullins, 2023). Finally, Pragati IT Solution, Nepal or other Nepalese SaaS providers should consider broader strategic factors which may influence customer satisfaction, such as organisational expectation, cost structures, available alternatives, pre-existing vendor relationship, and dependency condition with the existing system, etc, to address the contextual determinants that service quality measures alone cannot capture (Delone and McLean, 2003).. Collectively, these improvements would not only enhance service quality but also effectively drive overall customer satisfaction in the context of Pragati IT Solution, Nepal or other Nepalese SaaS providers.

5.3 Recommendation

The first objective of the study was to critically identify the key performance dimension of service quality as perceived by end users of Pragati IT Solution, Nepal. Thus, To enhance service quality and customer satisfaction, Pragati IT Solution should prioritise improvements in core functional dimensions such as reliability, flexibility and features because, based on the findings, these dimensions were the strongest contributors to users' perceptions of service quality. Responsiveness should be enhanced through faster support mechanisms, such as clear service level agreements (SLA), and a more efficient ticket-handling process (Setiono and Hidayat, 2022). Security is one of the most important dimensions of service quality and customer satisfaction of Pragati IT Solution, Nepal, thus Pragati IT Solution, Nepal should conduct regular security audits, stronger compliance practices and transparent communication of security measures to reinforce customers' trust (Malla, 2021). The negative association observed between rapport and satisfaction. This suggests that current interactions may be largely reactive and occur mainly when problems arise (Gremler and Gwinner, 2000). Therefore, rapport should be redesigned to focus on proactive engagement through dedicated support managers, routine review meetings, and a structured user feedback analysis loop (Gremler and Gwinner, 2000). Additionally, improvements in usability,

tailored training, and user support resources can better align the system with organisational needs (Good, Mangus and Ellen Bolman Pullins, 2023).

Similarly, the second objective of this study was to critically analyse the relationship between service quality and customer satisfaction. Based on the findings of this study, service quality explains only a small portion of satisfaction. Thus, additional holistic research is recommended to capture a better customer perception of overall customer satisfaction.

At the end, the final objective of this study was to provide critical recommendations for Pragati IT Solution, Nepal and other Nepalese SaaS providers to enhance service quality and improve customer satisfaction. One of the most important recommendations for better customer satisfaction is that additional research is needed to find better constructs for satisfaction, because, based on the findings of this study, service quality measures alone can not explain overall customer satisfaction. Moreover, Pragati IT Solution should adopt continuous monitoring mechanisms, using multi-item satisfaction measures and regular evaluation cycles to track service quality performance and guide ongoing enhancements (Abboodi, 2025).

5.4 Limitations

This study involves several limitations. First, the findings of this study are completely based on cross-sectional studies, which poses a limitation of being unable to conclusively confirm the direction of causality (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). The balance of logic in this study supports the idea that meeting service quality standards plays an important role in the formation of satisfaction and perceived usefulness of SaaS usage (Benlian et al. 2011). Longitudinal studies would help researchers to better understand the temporal relationships (e.g. how satisfaction in an earlier stage influences expectation level in later stages) between constructs (Watson, Pitt and Kavan, 1998). Second, data was collected from a single respondent within the organisation. The majority of respondents are senior-level decision makers with a comprehensive understanding of the organisation-wide SaaS uses, which ensures good data quality and minimises the potential problem of single respondent bias, but still exist concerns with

analyses based on self-reported data collected from a single source (Benlian et al. 2011; Olde Klieverik, 2023). Third, this study adopted convenience sampling and a relatively small sample size (129 respondents from a population of 2000). This may pose sampling bias and limit the generalisability of the findings to the wider SaaS user population in Nepal (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Fourth, this study showed extremely high multicollinearity among service quality constructs. This limits the interpretability of individual predictors in the analysis, which creates difficulties in isolating the unique effect of each construct (O'Brien, 2007; Vatcheva and Lee, 2016; Marcoulides and Raykov, 2019). Fifth, despite this study relying on the validated SaaS-Qual model and a single-item measure for overall satisfaction, single-item measures may not capture all dimensions of customer satisfaction, which could affect the study results. Finally, this study only focused on a single organisational context, which may limit the applicability of the findings to other SaaS providers or industries within Nepal (Benlian et al. 2011; Olde Klieverik, 2023).

5.5 Future Works

Future studies can build on this study by addressing its methodological and contextual limitations. First, longitudinal studies could provide insights into the causal relationship between service quality and customer satisfaction by tracking how early perceptions affect later expectations (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Second, the inclusion of multilevel users from an organisation, such as high-level decision makers or managers, to general users, may provide a holistic understanding of their SaaS experiences (Benlian et al. 2011; Olde Klieverik, 2023). Third, collecting a large sample based on stratified probability sampling may significantly reduce the sampling bias and significantly increase the generalisability of the result to the wider SaaS user population in Nepal (Al-Ababneh, 2020; Saunders et al., 2023; Asmawi and Alam, 2024). Fourth, consider alternative analytical approaches (e.g. structural equation modelling (SEM), partial least squares (PLS-SEM)) and research designs (e.g. data collection from multiple respondents per organisation, explore dimensional refinement or cultural adaptation of the SaaS-Qual model) to better handle interrelated constructs and isolate the unique contribution of each dimension to overall satisfaction (O'Brien, 2007; Vatcheva and Lee, 2016; Marcoulides

and Raykov, 2019). Fifth, future research could examine additional factors which may influence customer satisfaction, such as usability, switching costs, trust, digital maturity, and organisational dependencies, to develop a more comprehensive model for SaaS satisfaction (Pitt et al., 1995; Barki, Rivard and Talbot, 2001; Delone and McLean, 2003). Finally, future studies could expand a single organisational context to include multiple SaaS providers and diverse industries within Nepal. This might improve the generalisability of the findings (Benlian et al. 2011; Olde Klieverik, 2023).

Reference

- Abboodi, M. (2025). *A framework for measuring and analyzing customer satisfaction at computer service companies using Lean Six Sigma*. [online] arXiv.org. Available at: <https://arxiv.org/abs/2511.11723> [Accessed 15 Oct. 2025].
- Agarwal, R. and Dhingra, S. (2023). Factors influencing cloud service quality and their relationship with customer satisfaction and loyalty. *Helijon*, 9(4), p.e15177. doi:<https://doi.org/10.1016/j.heliyon.2023.e15177> [Accessed 15 Oct. 2025].
- Al-Ababneh, M.M. (2020). Linking Ontology, Epistemology and Research Methodology. *Science & Philosophy*, 8(1), pp.75–91. doi:<https://doi.org/10.23756/sp.v8i1.500> [Accessed 15 Oct. 2025].
- Amin, N. and Salim, S.A. (2025). The Relationship between Security and Customer Satisfaction in Digital Wallet Services. *Research in Management of Technology and Business*, [online] 6(2), pp.374–387. Available at: <https://publisher.uthm.edu.my/periodicals/index.php/rmtb/article/view/21668> [[Accessed 15 Oct. 2025].
- Asmawi, A. and Alam, M.S. (2024). Qualitative research: Understanding its underlying philosophies. *Forum for Philosophical Studies*, [online] 2(1), pp.2836–2836. doi:<https://doi.org/10.59400/fps2836> [Accessed 2 Dec. 2025].
- Barki, H., Rivard, S. and Talbot, J. (2001). An Integrative Contingency Model of Software Project Risk Management. *Journal of Management Information Systems*, [online] 17(4), pp.37–69. Available at: <https://www.jstor.org/stable/40398504> [Accessed 2 Dec. 2025].
- Basiran, N.H. and Yusof, M.Mohd. (2021). Measuring factors influencing quality of software-as-a-service. *Information Development*, p.026666692110563. doi:<https://doi.org/10.1177/02666669211056368> [Accessed 15 Oct. 2025].
- Benlian, A., Koufaris, M. and Hess, T. (2011). Service Quality in Software-as-a-Service: Developing the SaaS-Qual Measure and Examining Its Role in Usage Continuance. *Journal of*

Management Information Systems, 28(3), pp.85–126. doi:<https://doi.org/10.2753/mis0742-1222280303>. [Accessed 31 Jul. 2025].

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. 26. https://aisel.aisnet.org/icis2010_submissions/26 [Accessed 31 Jul. 2025].

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly*, 25(3), pp.351–370. <https://doi.org/10.2307/3250921> [Accessed 31 Jul. 2025].

Bryman, A. (2016). *Social Research Methods*. [online] Google Books. Available at: https://books.google.ie/books/about/Social_Research_Methods.html?id=N2zQCgAAQBAJ [Accessed 13 Nov. 2025].

Bryman, A. (2016). *Social Research Methods*. 5th edn. Oxford: Oxford University Press

Cheung, G.W., Cooper-Thomas, H.D., Lau, R.S. and Wang, L.C. (2023). Reporting reliability, Convergent and Discriminant Validity with Structural Equation modeling: a Review and best-practice Recommendations. *Asia Pacific Journal of Management*, 1(1). doi:<https://doi.org/10.1007/s10490-023-09871-y> [Accessed 15 Oct. 2025].

Chou, S.-W. and Chiang, C.-H. (2013). Understanding the formation of software-as-a-service (SaaS) satisfaction from the perspective of service quality. *Decision Support Systems*, [online] 56, pp.148–155. <https://doi.org/10.1016/j.dss.2013.05.013> [Accessed 15 Oct. 2025].

Chou, T.-H. (2019). Exploring Relationship Quality of User's Cloud Service. *Journal of Organizational and End User Computing*, 31(3), pp.17–36. doi:<https://doi.org/10.4018/joeuc.2019070102> [Accessed 15 Oct. 2025].

Christophersen, T. and Konradt, U. (2011). Reliability, validity, and sensitivity of a single-item measure of online store usability. *International Journal of Human-Computer Studies*, 69(4), pp.269–280. doi:<https://doi.org/10.1016/j.ijhcs.2010.10.005> [Accessed 2 Dec. 2025].

Crosby, L. A., Evans, K. R., & Cowles, D. (1990). Relationship quality in services selling: An interpersonal influence perspective. *Journal of Marketing*, 54(3), 68–81.
<https://doi.org/10.2307/1251817> [Accessed 2 Dec. 2025].

Davis, F.D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, [online] 38(3), pp.475–487. doi:<https://doi.org/10.1006/imms.1993.1022> [Accessed 15 Oct. 2025].

Delone, W. H., & McLean, E. R. (2004). Measuring e-commerce success: applying the Delone & McLean information systems success model. *International Journal of Electronic Commerce*, 9(1), 31–47. <https://doi.org/10.1080/10864415.2004.11044317> [Accessed 15 Oct. 2025].

Dr. Hannes Nel, D. Com and D. Phil (2019). *Research Article 12: Interpretivism – iNtgrty*. [online] Intgrty.co.za. Available at: <https://www.intgrty.co.za/2019/07/08/research-article-12-interpretivism> [Accessed 21 Oct. 2025].

Du, J., Lu, J., Wu, D., Li, H., & Li, J. (2013). User acceptance of software as a service: evidence from customers of China's leading e-commerce company, Alibaba. *The Journal of Systems & Software*, 86(8), 2034–2044. <https://doi.org/10.1016/j.jss.2013.03.012> [Accessed 2 Dec. 2025].

Etikan, I., Musa, S.A. and Alkassim, R.S. (2016). *Comparison of convenience sampling and purposive sampling*. *American Journal of Theoretical and Applied Statistics*, 5(1), pp.1–4. Available at: <https://doi.org/10.11648/j.ajtas.20160501.1> [Accessed 31 Jul. 2025].

Field, A. (2018) *Discovering Statistics Using IBM SPSS Statistics*. 5th edn. London: Sage.

Freitas, A.L.P. and Freitas Neto, M.M. (2017). Assessing the Service Quality in Software-as-a-Service from the Customers' Perspective: a Methodological Approach and Case of Use. *Production*, 27(0). <http://doi.org/10.1590/0103-6513.20170020> [Accessed: 2 August 2025].

Ghimire, P., Piaralal, S.K., Raghavan, S. and Rethina, V.S. (2024). Exploring Sustainability in Cloud Computing Adoption among SMEs in Nepal: A Conceptual Model. *International Journal of Academic Research in Business and Social Sciences*, 14(11). doi:<https://doi.org/10.6007/ijarbss/v14-i11/23347> [Accessed 15 Oct. 2025].

Good, V., Mangus, S.M. and Ellen Bolman Pullins (2023). Salesperson rapport: a literature review and research agenda for an evolving digital sales process. *Journal of Personal Selling and Sales Management*, pp.1–22. doi:<https://doi.org/10.1080/08853134.2023.2236483> [Accessed 2 Dec. 2025].

Gremler, D.D. and Gwinner, K.P. (2000). Customer-Employee Rapport in Service Relationships. *Journal of Service Research*, 3(1), pp.82–104.

Gunawan, J., Marzilli, C. and Aungsuroch, Y. (2021). Establishing appropriate sample size for developing and validating a questionnaire in nursing research. *Belitung Nursing Journal*, 7(5), pp.356–360. doi:<https://doi.org/10.33546/bnj.1927> [Accessed 2 Dec. 2025].

Hariguna, T. and Ruangkanjanases, A. (2024). Assessing the Impact of Artificial Intelligence on Customer performance: a Quantitative Study Using Partial Least Squares Methodology. *Data Science and Management*, 7(3). doi:<https://doi.org/10.1016/j.dsm.2024.01.001> [Accessed 15 Oct. 2025].

Huang, P.-L., Lee, B.C.Y. and Chen, C.-C. (2019). The influence of service quality on customer satisfaction and loyalty in B2B technology service industry. *Total Quality Management & Business Excellence*, 30(13-14), pp.1449–1465.

doi:<https://doi.org/10.1080/14783363.2017.1372184> [Accessed 15 Oct. 2025].

Jagli, D., Purohit, S. and Subhash, C.N. (2019). *SAASQUAL: A Quality Model For Evaluating SaaS on The Cloud Computing Environment*. [online] arXiv.org. Available at: <https://arxiv.org/abs/1905.10531> [Accessed 15 Oct. 2025].

Jimenez Fernandez, E. and Ruiz Martos, M.J. (2020). REVIEW OF SOME STATISTICAL METHODS FOR CONSTRUCTING COMPOSITE INDICATORS. *Studies of Applied Economics*, 38(1). doi:<https://doi.org/10.25115/eea.v38i1.3002> [Accessed 2 Dec. 2025].

Joseph, M.B. and Reynaldo, C. (2025). *Construct Development and Validation of Service Quality in the Context of Private Hospitals - International Journal of Research and Innovation in Social Science*. [online] International Journal of Research and Innovation in Social Science.

Available at: <https://rsisinternational.org/journals/ijriss/articles/construct-development-and-validation-of-service-quality-in-the-context-of-private-hospitals> [Accessed 26 Nov. 2025].

Kaushik, V. and Walsh, C.A. (2019). Pragmatism as a research paradigm and its implications for social work research. *Social Sciences*, 8(9), pp.1–17. doi:<https://doi.org/10.3390/socsci8090255> [Accessed 2 Dec. 2025].

Kettinger, W. J., & Lee, C. C. (1997). Pragmatic perspectives on the measurement of information systems service quality. *Mis Quarterly*, 21(2), 223–240. <https://doi.org/10.2307/249421> [Accessed 2 Dec. 2025].

Lederer, A.L., Maupin, D.J., Sena, M.P. and Zhuang, Y. (2013) ‘The Technology Acceptance Model and the SaaS Qual Model: Measuring SaaS service quality’, *Journal of Information Technology Management*, 24(2), pp. 35-47.

Li, B. and Kumar, S. (2022). Managing Software-as-a-Service: Pricing and operations. *Production and Operations Management*, 31(6), pp.2588–2608.
doi:<https://doi.org/10.1111/poms.13729> [Accessed 15 Oct. 2025].

Liu, X. and Prybutok, V.R. (2020). An empirical investigation of factors that drive a user decision to continue using cloud storage services. *Journal of Decision Systems*, pp.1–23.
doi:<https://doi.org/10.1080/12460125.2020.1798590> [Accessed 15 Oct. 2025].

Malla, P. (2021). Role of Service Quality and Perceived Security. *Journal of International Business Research*, [online] 20(1), pp.1–126. Available at:
<https://www.abacademies.org/articles/role-of-service-quality-and-perceived-security-10100.html> [Accessed 2 Dec. 2025].

Marcoulides, K.M. and Raykov, T. (2019). Evaluation of Variance Inflation Factors in Regression Models Using Latent Variable Modeling Methods. *Educational and Psychological Measurement*, 79(5), pp.874–882. doi:<https://doi.org/10.1177/0013164418817803> [Accessed 2 Dec. 2025].

Martins, R., Oliveira, T., Thomas, M. and Tomás, S. (2019). Firms' continuance intention on SaaS use – an empirical study. *Information Technology & People*, 32(1), 189-216.
<https://doi.org/10.1108/ITP-01-2018-0027> [Accessed 15 Oct. 2025].

Mazziotta, M. and Pareto, A. (2024). Principal component analysis for constructing socio-economic composite indicators: theoretical and empirical considerations. *SN Social Sciences*, 4(6). doi:<https://doi.org/10.1007/s43545-024-00920-x> [Accessed 2 Dec. 2025].

Neupane, M. (2018). *Pragati IT Solutions*. [online] Pragatiit.com.np. Available at: <https://pragatiit.com.np/> [Accessed 31 Jul. 2025].

Nunnally, J.C. and Bernstein, I.H. (1994). *Psychometric theory*. 3rd ed. New York: McGraw-Hill.

O'Brien, R.M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, 41(5), pp.673–690. doi:<https://doi.org/10.1007/s11135-006-9018-6> [Accessed 2 Dec. 2025].

Olde Klieverik, R. (2023). *MEASURING CUSTOMER SATISFACTION AT A SAAS PROVIDER: A B2B PERSPECTIVE*. [online] Available at: https://essay.utwente.nl/fileshare/file/94287/Olde_Klieverik_MA_BMS.pdf [Accessed 12 Oct. 2025].

Pallant, J. (2020). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS*. 7th ed. London: Routledge. doi:<https://doi.org/10.4324/9781003117452> [Accessed 2 Dec. 2025].

Parasuraman, A.P., Zeithaml, V.A. and Berry, L.L. (1985). (*PDF*) *A Conceptual Model of Service Quality and its Implication for Future Research (SERVQUAL)*. [online] ResearchGate. Available at:

https://www.researchgate.net/publication/225083670_A_Conceptual_Model_of_Service_Quality_and_its_Implication_for_Future_Research_SERVQUAL [Accessed 15 Oct. 2025].

Parasuraman, A.P., Zeithaml, V.A. and Berry, L.L. (1988). *SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality*. [online] ResearchGate. Available at:

https://www.researchgate.net/publication/225083802_SERVQUAL_A_multiple-Item_Scale_for_measuring_consumer_perceptions_of_service_quality [Accessed 15 Oct. 2025].

Pitt, L.F., Watson, R.T. and Kavan, C.B. (1995). Service Quality: A Measure of Information Systems Effectiveness. *MIS Quarterly*, 19(2), p.173. doi:<https://doi.org/10.2307/249687> [Accessed 15 Oct. 2025].

Qasem Ali, A., Md Sultan, A., Abd Ghani, A. and Zulzalil, H. (2021). An Empirical Investigation of Software Customization and Its Impact on the Quality of Software as a Service: Perspectives from Software Professionals. *Applied Sciences*, 11(4), p.1677. doi:<https://doi.org/10.3390/app11041677> [Accessed 15 Oct. 2025].

Qian, L., Luo, Z., Du, Y., & Guo, L. (2009). Cloud computing: An overview. In IEEE international conference on cloud computing. 626-631. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-10665-1_63 [Accessed 2 Dec. 2025].

Samuels, P. (2017). *Advice on Reliability Analysis with Small Samples - Revised Version*. [online] www.researchgate.net. Available at: https://www.researchgate.net/publication/319165684_Advice_on_Reliability_Analysis_with_Small_Samples_-_Revised_Version [Accessed 2017].

Saunders, M., Lewis, P. and Thornhill, A. (2023). *Research Methods for Business Students*. 9th ed. Harlow: Pearson Education.

Setiono, B.A. and Hidayat, S. (2022). Influence of service quality with the dimensions of reliability, responsiveness, assurance, empathy and tangibles on customer satisfaction. *International Journal of Economics, Business and Management Research*, [online] 6(9), pp.330–341. doi:<https://doi.org/10.51505/ijebmr.2022.6924> [[Accessed 15 Oct. 2025].

Shil, N. C., Ali, M. A., Paiker, N.R. (2010). Robust customer satisfaction model using QFD. *International Journal Productivity and Quality Management*, 6(1), 112–136. <http://doi.org/10.1504/IJPQM.2010.033887> [Accessed 2 Dec. 2025].

Sigala, M. (2004). The asp-qual model: measuring asp service quality in Greece. *Managing Service Quality*, 14(1), 103–114. <https://doi.org/10.1108/09604520410513703> [Accessed 2 Dec. 2025].

Ulster University (2018). *POLICY FOR THE GOVERNANCE OF RESEARCH INVOLVING HUMAN PARTICIPANTS*. [online] Available at:
https://www.ulster.ac.uk/_data/assets/pdf_file/0003/331878/Policy-Human-Research-V5.pdf
[Accessed 31 Jul. 2025].

Vatcheva, K.P. and Lee, M. (2016). Multicollinearity in Regression Analyses Conducted in Epidemiologic Studies. *Epidemiology: Open Access*, [online] 06(02).
doi:<https://doi.org/10.4172/2161-1165.1000227> [Accessed 2 Dec. 2025].

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003). User Acceptance of Information technology: toward a Unified View. *MIS Quarterly*, 27(3), pp.425–478.
doi:<https://doi.org/10.2307/30036540> [Accessed 2 Dec. 2025].

Watson, R.T., Pitt, L.F. and Kavan, C.B. (1998). Measuring Information Systems Service Quality: Lessons from Two Longitudinal Case Studies. *MIS Quarterly*, 22(1), p.61.
doi:<https://doi.org/10.2307/249678> [Accessed 15 Oct. 2025].

Yang, H.-L. and Lin, S.-L. (2015). User continuance intention to use cloud storage service. *Computers in Human Behavior*, 52, pp.219–232. doi:<https://doi.org/10.1016/j.chb.2015.05.057>
[Accessed 15 Oct. 2025].

Yusof, M. M., Kuljis, J., Papazafeiropoulou, A., & Stergioulas, L. K. (2008). An evaluation framework for health information systems: human, organization and technology-fit factors (hotfit). *International Journal of Medical Informatics*, 77(6), 386–398.
<https://doi.org/10.1016/j.ijmedinf.2007.08.011> [Accessed 15 Oct. 2025].

Appendix

Appendix 2.1: Concept of existing models

Model	SERVQUAL Model	SaaS-Qual Model	SaaS Model	Alternative to SERVQUAL and SERVPERF	SaaS-CRM	Integrated SOR and IT continuance decision model	SaaS-Qual Model with Improvisation	Used in # models
Publication	(Parasuraman, Zeithaml and Berry, 1988)	(Benlian, Koufaris and Hess, 2011)	(Chou and Chiang, 2013)	(Freitas and Freitas Neto, 2017)	(Chou, 2019)	(Liu and Prybutok, 2020)	(Olde Klieverik, 2023)	
Factors/ Constructs	Reliability	Reliability		Reliability	Reliability	Reliability	Reliability	6
		Flexibility	Flexibility		Flexibility	Flexibility	Flexibility	5
		Rapport	Rapport		Rapport		Rapport	4
	Responsiveness	Responsiveness			Responsiveness		Responsiveness	4
		Satisfaction	Satisfaction		Satisfaction		Satisfaction	4
		Continuous intention			Continuous Intention	Continuous intention	Continuous Intention	4
		Features			Features		Features	3
		Security			Security			2
		Perceived usefulness			Perceived usefulness	Perceived Benefit		3
			Competence based trust		Trust		Trust	3
				Customer service				1
				Customer assistance				1
				Business Processes				1
				Accessibility				1
	Asurance							1
	Tangibles							1
	Empathy							1
			Openness-based					1
			Trust					1
			Relational norms					1

Source: (Author's own work)

Appendix 3.1: Literature review summary of methodological choices

Literature	Layer	Likely choice / inference	Rationale / caveats
A Conceptual Model of Service Quality and its Implication for Future Research (Parasuraman, Zeithaml & Berry 1985)	Philosophy	Positivism	The study develops a conceptual model treating service quality as measurable and objectively real. Caveat: some interpretivist elements exist in discussing the meaning of quality.
	Approach to theory	Deductive	The model is derived from existing literature and prior theory. Caveat: some inductive insights may emerge, but the primary approach is deductive.
	Research strategy	Conceptual / model-building	Focuses on identifying service quality dimensions and proposing future research directions rather than conducting fieldwork.
	Method choice	Mono-method (qualitative conceptual)	Based on literature review and conceptual development. Caveat: there may have been some preliminary empirical work.
	Time horizon	Cross-sectional / one-off	Represents a single point in time; no longitudinal data.
	Techniques & procedures	Literature review, model derivation, dimension identification	Authors review previous research, identify key dimensions, and propose the model. Typical steps are not detailed.
SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality (Parasuraman, Zeithaml & Berry, 1988)	Philosophy	Positivism	Assumes service quality can be measured and analyzed quantitatively.
	Approach to Theory	Deductive	Items are derived from prior research and theory, then tested empirically.
	Research Strategy	Survey / scale development	Uses focus groups and interviews to generate items, followed by a large-scale survey.
	Method Choice	Mono-method quantitative (with qualitative pilot)	Survey and psychometric testing are primary; initial qualitative work supports item generation.
	Time Horizon	Cross-sectional	Data collected at a single point in time.

	Techniques & Procedures	Focus groups, interviews, survey, factor analysis, reliability and validity testing	Follows standard measurement development procedures.
Understanding Information Systems Continuance: An Expectation-Confirmation Model (Bhattacherjee, 2001)	Philosophy	Positivism	Quantitative modeling tests hypotheses about IS continuance.
	Approach to Theory	Deductive	Adapts Expectation-Confirmation Theory (ECT) and TAM to IS continuance.
	Research Strategy	Survey / empirical field study	Collects data from online banking users to test hypotheses.
	Method Choice	Mono-method quantitative	Uses a survey and statistical analysis exclusively.
	Time Horizon	Cross-sectional	Data collected once.
	Techniques & Procedures	Questionnaire measuring confirmation, satisfaction, perceived usefulness, continuance intention; regression/SEM	Standard statistical analysis of survey data.
The Role of SaaS Service Quality for Continued SaaS Use (Benlian, Koufaris & Hess, 2010)	Philosophy	Positivism	Empirical study using measurable constructs and statistical testing.
	Approach to Theory	Deductive	Hypotheses derived from service quality and IS continuance theories.
	Research Strategy	Survey / empirical study	Data collected from SaaS-using firms.

	Method Choice	Mono-method quantitative	Based on quantitative survey; qualitative aspects not evident.
	Time Horizon	Cross-sectional	Single time data collection.
	Techniques & Procedures	Questionnaire on SaaS service quality; regression/SEM	Analyzes impact of service quality on continuance.
Developing the Saa-Qual Measure and Examining the role in uses continuance (Benlian, Koufairs & Hess, 2011)	Philosophy	Positivism	The study develops and empirically tests a measurement instrument (SaaS-Qual) and uses statistical methods to analyze relationships, for example, service quality → usage continuance. This aligns with assuming objective constructs, measurable variables, and causal relationships.
	Approach to Theory	Mixed (largely deductive plus instrument development)	Service quality dimensions are derived from prior literature (deductive) and empirical qualitative work (interviews, card sorting), and then tested quantitatively. Instrument development also incorporates inductive identification of new factors like security and flexibility.
	Research Strategy	Instrument development + survey (empirical field study)	The study first conducts qualitative work (interviews, focus groups, card sorting), then surveys SaaS-using firms to refine and validate the instrument, and finally relates the measure to continuance intention.
	Method Choice	Mixed-method (although with qualitative pre-work for scale development)	The main empirical data collection is quantitative (surveys, psychometric testing, modeling). The qualitative component is only used to support scale development rather than for full theory building.

	Time Horizon	Cross-sectional	Surveys and instrument validation capture data at a single point in time; there is no longitudinal panel tracking.
	Techniques & Procedures	Literature review; interviews/focus groups; card-sorting exercise; survey(s) of SaaS firms; instrument validation (psychometrics); modelling service quality → continuance relationships	The study combines qualitative pre-work (interviews, focus groups, card sorting) with two surveys of SaaS-using companies. Validation includes dimensions such as rapport, responsiveness, reliability, features, plus newly identified factors security and flexibility.
Assessing the Service Quality in SaaS from the Customers' Perspective (Freitas & Freitas Neto, 2017)	Philosophy	Positivism	Uses quantitative techniques such as factor analysis to assess SaaS service quality.
	Approach to Theory	Inductive / mixed	Factor analysis derives dimensions from data, incorporates criticisms of SERVQUAL.
	Research Strategy	Case study + quantitative instrument development	Combines method development with application to a practical case.
	Method Choice	Mixed method	Factor analysis plus applied case study.
	Time Horizon	Cross-sectional	Data collected at one point.
	Techniques & Procedures	Factor analysis, quartile analysis, case application	Factor analysis identifies dimensions, quartile analysis highlights critical items, applied in case context.
Exploring Relationship	Philosophy	Positivism	Examines relationship quality using quantitative methods.

Quality of User's Cloud Service (Chou, 2019)	Approach to Theory	Deductive	Builds on relationship quality theory and tests it in cloud service context.
	Research Strategy	Survey / empirical study	Collects user data to examine relationship quality.
	Method Choice	Mono-method quantitative	Quantitative survey analysis.
	Time Horizon	Cross-sectional	Single point in time.
	Techniques & Procedures	Questionnaire, statistical modeling (SEM)	Measures constructs like relationship quality and analyzes relationships.
An Empirical Investigation of Factors Driving Continuance of Cloud Storage Services (Liu & Prybutok, 2020)	Philosophy	Positivism	Empirical study analyzing measurable factors with statistical tests.
	Approach to Theory	Deductive	Hypotheses based on prior research on continuance and service quality.
	Research Strategy	Survey/ empirical field study	Data collected from cloud storage users.
	Method Choice	Mono-method quantitative	Survey-based quantitative study.
	Time Horizon	Cross-sectional	One-time data collection.
	Techniques & Procedures	Questionnaire, regression/SEM	Standard survey and statistical analysis.
Measuring Customer Satisfaction at a SaaS Provider: A	Philosophy	Positivism	Quantitative measurement of customer satisfaction in B2B SaaS.
	Approach to Theory	Deductive	Draws on satisfaction and service quality theories.

B2B Perspective (Olde Klieverik, 2023)	Research Strategy	Survey/ applied case study	Data collected within a specific SaaS provider context.
	Method Choice	Mono-method quantitative	Primarily survey-based; case context supplements data.
	Time Horizon	Cross-sectional	Single point in time.
	Techniques & Procedures	Structured survey, statistical analysis	Measures satisfaction levels and analyzes responses statistically.

Source: (Author's own work)

Appendix 3.2: Research Onion Model

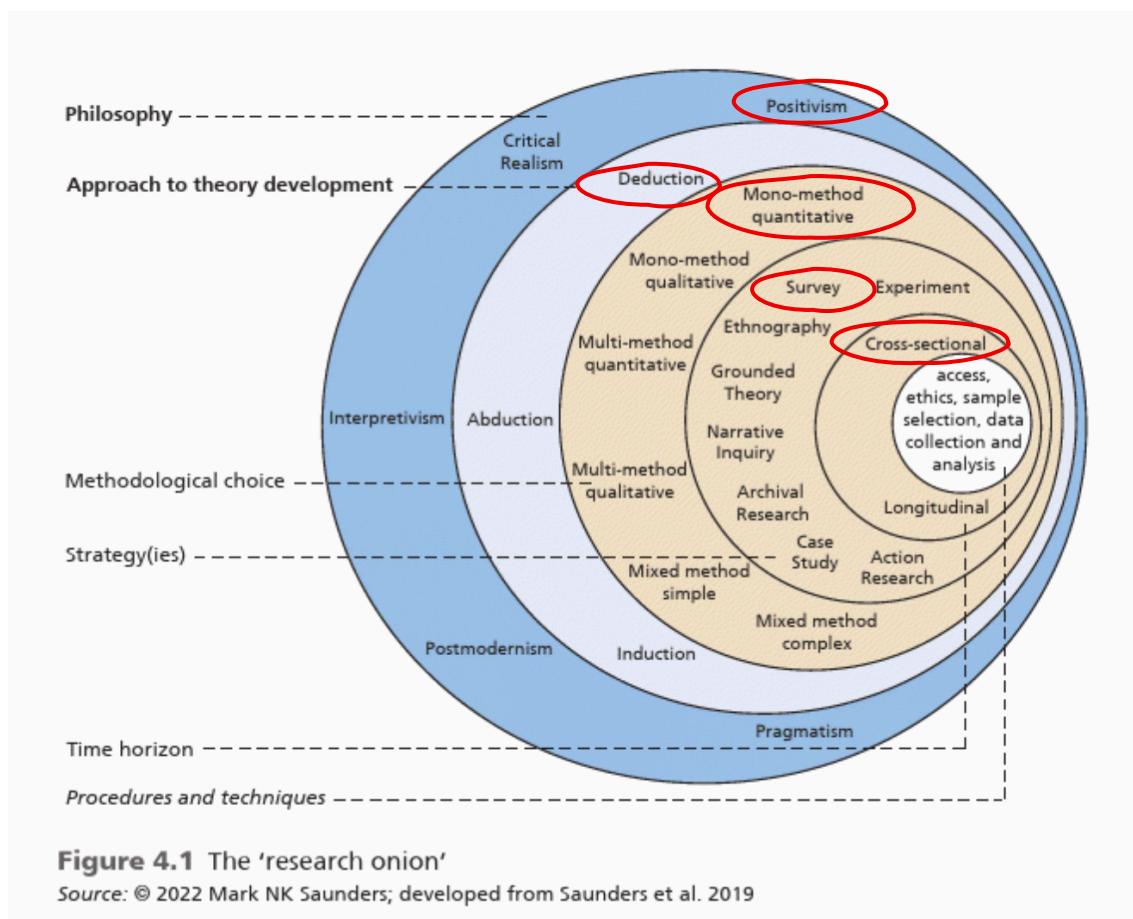


Figure 4.1 The 'research onion'

Source: © 2022 Mark NK Saunders; developed from Saunders et al. 2019

Source: Research Onion model (Saunders, Lewis and Thornhill, 2023, p. 131)

Appendix 3.3: Constructs for the SaaS-Qual Scale for survey

Dimension	Item Code	Item Description
Rapport (Ra)	Ra1	a shared approach to problem solving
	Ra2	customer-specific trainings and courses
	Ra3	understanding our business goals and processes
	Ra4	a good personal relationship
	Ra5	an aligned working style (e.g., convenient operating hours)
	Ra6	having the knowledge to answer customers' questions
	Ra7	the cultural fit between SaaS provider and our company
	Ra8	support that is tailored to our individual needs
	Ra9	having the customer's best interest at heart
Responsiveness (Res)	Res1	system availability/uptime for business (e.g., system crash or freeze)
	Res2	network performance
	Res3	efficient disaster recovery
	Res4	efficient contingency and replacement policy
	Res5	hardware and software redundancy
	Res6	an adequate number of service personnel dedicated to our company
	Res7	the support of up-to-date, cutting-edge hardware, software, and netware technology
	Res8	(technical) support availability (i.e., the promptness of providing services)
	Res9	(multichannel) customer care (i.e., the SaaS provider's willingness to help users)
Reliability (Rel)	Rel1	providing services at the promised time
	Rel2	performing services right the first time
	Rel3	fulfilling the obligations to the contract (including SLAs)
	Rel4	user problems, our SaaS provider shows a sincere interest in solving them reliably
	Rel5	the provision of error-free services and accurate budgetary controls
Flexibility (Fl)	Fl1	the integration and interoperability of the SaaS application with our ICT infrastructure
	Fl2	application scalability (i.e., number of user subscriptions)
	Fl3	modularity of features from which can be chosen (i.e., packaging choices)
	Fl4	having access to the latest software versions
	Fl5	modifying contractual parameters at later stages
	Fl6	choices of ways to pay (e.g., payment/billing options)
Features (Fe)	Fe1	a visually appealing and sympathetic user interface
	Fe2	a user-friendly navigation structure and search functionality
	Fe3	data reporting and extracting features

	Fe4	the SaaS application's configuration (e.g., user administration, etc.) features
	Fe5	the SaaS application's help functionalities
	Fe6	the dashboard features with metrics measuring customers service usage
	Fe7	the SaaS application's core features to support process steps/activities
Security (Sec)	Sec1	data backup and recovery
	Sec2	regular security audits
	Sec3	providing a secure physical environment (i.e., secure data center)
	Sec4	anti-virus protection
	Sec5	data encryption
	Sec6	data confidentiality
Satisfaction (Sat)	Sat1	How do you feel about your overall experience of using the SaaS-based software delivery model?

Source: Items for the SaaS-Qual Scale (Benlian et al. 2011)

Appendix 3.4: Final Constructs for the SaaS-Qual Scale for this study

Out of 42 service quality measurement items proposed by Benlian et al. (2011), the following 30 items have been selected based on the top five out of each dimension to reduce the survey time of respondents. Responses have been collected in five Point Likert Scale strongly disagree to strongly agree.

Dimension	Question No.	Questionnaire Item
Rapport (Ra)	Ra1	Veda Software shares a collaborative approach to solving our problems.
	Ra2	Veda Software offers customer-specific trainings and courses.
	Ra3	Veda Software understands our business goals and processes.
	Ra4	Veda Software maintains a good personal relationship with our team.
	Ra5	Veda Software aligns its working style with our needs (e.g., convenient operating hours).
Responsiveness (Res)	Res1	Veda Software's system is consistently available and rarely crashes.
	Res2	Network performance of Veda Software meets our business requirements.
	Res3	Veda Software recovers quickly from disasters or service interruptions.
	Res4	Veda Software has efficient contingency and replacement policies.
	Res5	Adequate personnel are available at Veda Software to support our company promptly.

Dimension	Question No.	Questionnaire Item
Reliability (Rel)	Rel1	Veda Software delivers services at the promised time.
	Rel2	Services provided by Veda Software are performed correctly the first time.
	Rel3	Veda Software fulfills contractual obligations, including SLAs.
	Rel4	Veda Software reliably solves user problems with sincerity.
	Rel5	Services from Veda Software are mostly error-free and budgetary controls are accurate.
Flexibility (Fl)	Fl1	Veda Software integrates well with our ICT infrastructure.
	Fl2	Veda Software's service is scalable to accommodate more users as needed.
	Fl3	We can select modular features or packaging options from Veda Software to meet our needs.
	Fl4	Veda Software provides access to the latest software versions.
	Fl5	Contractual parameters with Veda Software can be modified when our requirements change.
Features (Fe)	Fe1	Veda Software has a visually appealing and user-friendly interface.
	Fe2	Navigation and search functions in Veda Software are intuitive and easy to use.
	Fe3	Data reporting and extraction features of Veda Software meet our requirements.
	Fe4	Configuration and administration features in Veda Software are adequate for our operations.
	Fe5	Help functionalities, dashboards, and core features of Veda Software support our business processes.
Security (Sec)	Sec1	Veda Software's data backup and recovery processes are reliable.
	Sec2	Veda Software conducts regular security audits to ensure safety.
	Sec3	Veda Software maintains a secure physical environment (data center).
	Sec4	Anti-virus and security protections of Veda Software are robust.
	Sec5	Data encryption and confidentiality measures at Veda Software are strictly followed.
Satisfaction (Sat)	Sat1	How do you feel about your overall experience of using the SaaS-based software delivery model?

Source: (Author's own work based on Appendix 3.3)

Appendix: 3.5: Sample Survey Questionnaire

This sample survey questionnaire has been developed based on the Final Items for the SaaS-Qual Scale for this study (Appendix 3.4), where some demographic items are added to enhance multi-dimensional analysis on demographic parameters. Statements have also been provided in the Nepali language to facilitate better understanding within the Nepalese context.

Please tick the option that applies	
Items	Responses
Department/Function	<input type="checkbox"/> IT <input type="checkbox"/> HR <input type="checkbox"/> Finance <input type="checkbox"/> Account <input type="checkbox"/> Operations <input type="checkbox"/> Exam <input type="checkbox"/> Teaching <input type="checkbox"/> Other
Type of Veda Software Module Used	<input type="checkbox"/> School Management <input type="checkbox"/> Accounting <input type="checkbox"/> Finance <input type="checkbox"/> Attendance
Frequency of Veda Software Usage	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Rarely
Duration of Using Veda Software	<input type="checkbox"/> Less than 6 months <input type="checkbox"/> 6 months – 1 year <input type="checkbox"/> 1 – 3 years <input type="checkbox"/> More than 3 years
Please select one option that best represents your level of agreement	
1. Veda Software shares a collaborative approach to solving your problems.	
<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree	
2. Veda Software offers customer-specific trainings and courses.	
<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree	
3. Veda Software understands your business goals and processes.	
<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree	
4. Veda Software maintains a good personal relationship with your team.	
<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree	
5. Veda Software aligns its working style with your needs (e.g., convenient operating hours).	
<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree	
6. Veda Software's system is consistently available and rarely crashes.	
<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree	

7. Network performance of Veda Software meets your business requirements.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
8. Veda Software recovers quickly from disasters or service interruptions.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
9. Veda Software has efficient contingency and replacement policies.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
10. Adequate personnel are available at Veda Software to support your company promptly.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
11. Veda Software delivers services at the promised time.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
12. Services provided by Veda Software are performed correctly.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
13. Veda Software fulfills contractual obligations, including Service Level Agreement.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
14. Veda Software reliably solves user problems with sincerity.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
15. Services from Veda Software are mostly error-free and budgetary controls are accurate.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
16. Veda Software integrates well with our ICT infrastructure.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
17. Veda Software's service is scalable to accommodate more users as needed.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
18. We can select modular features or packaging options from Veda Software to meet our needs.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
19. Veda Software provides access to the latest software versions.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
20. Contractual parameters with Veda Software can be modified when our requirements change.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
21. Veda Software has a visually appealing and user-friendly interface.	<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree

<p>22. Navigation and search functions in Veda Software are intuitive and easy to use.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>23. Data reporting and extraction features of Veda Software meet your requirements.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>24. Configuration and administration features in Veda Software are adequate for your operations.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>25. Help functionalities, dashboards, and core features of Veda Software support your business processes.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>26. Veda Software's data backup and recovery processes are reliable.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>27. Veda Software conducts regular security audits to ensure safety.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>28. Veda Software maintains a secure physical environment.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>29. Anti-virus and security protections of Veda Software are robust.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>30. Data encryption and confidentiality measures at Veda Software are strictly followed.</p> <p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree</p>
<p>How do you feel about your overall experience of using the SaaS-based software delivery model?</p> <p><input type="checkbox"/> Strongly Unsatisfied <input type="checkbox"/> Unsatisfied <input type="checkbox"/> Neutral <input type="checkbox"/> Satisfied <input type="checkbox"/> Strongly Satisfied</p>

Source: (Author's own work)

Note: Veda Software is a SaaS product of Pragati IT Solution, Nepal, and they use Veda as a brand name in the market. Thus, the Veda Software name is used in the questionnaire for easy understanding by customers.

Appendix 3.6 Ethical Approval Form

Ulster @ QAHE

Ethical Approval Form

Dissertations / Projects involving Human Participants

READ THE FOLLOWING INFORMATION CAREFULLY

This Ethical Approval Form must be completed by all students intending to undertake research as part of their Ulster University Masters course. This form specifically focuses on students on the following Masters courses:

- MSc International Business
- MSc Human Resource Management
- MSc Health Promotion and Public Health

This Ethical Approval Form must be completed by all students and submitted by the end of the following modules which precede the start of their Dissertation where the research will be undertaken:

- International Business Research Methods
- Management Research for HR Practice
- Project Planning and Public Health Practice

Before starting to complete the Ethical Approval Form, reference should be made to the Ulster University Guidance on Ethical Standards for Research involving Human Participants:

- https://www.ulster.ac.uk/__data/assets/pdf_file/0003/331878/Policy-Human-Research-V5.pdf

When filing up the Ethical Approval Form ensure you provide all information that each question requires:

- Questions shown with a red * are compulsory and must be answered;
- Questions without a red * can be answered once information is made available;
- The last section (*Supervisor's Section*) should be left blank for the supervisor to fill.

Once the Ethical Approval Form is filled out:

- click on "**Submit**"
- click on the 3 horizontal dots (...) at the top right of your browser screen and select '*Print response*' and print the form as a *pdf file*.
- click on "**Save my response**" so that you can edit it later to make changes if you need to update it or your supervisor asks you to;

At the start of your Dissertation / Project, email the pdf of your Ethical Approved Form to your assigned supervisor who will review it before any research / fieldwork is carried out, irrespective of this being primary or secondary, to:

- evaluate the potential impact of the research on the intended human participants, and
either
 - approve and sign the Ethical Approval Form, email it back to you to upload on Turnitin, and then start collecting data,
- reject the Ethical Approval Form, ask you to modify specific sections, and then re-evaluate it until it gets approved so that you may start collecting data.

Once the Ethical Approval Form is *approved* by the supervisor:

- submit the approved form on Turnitin by the end of week 4;
- drag and drop the approved form in the Appendix of your Dissertation / Project.

The Dissertation / Project will not be marked if the Ethical Approval Form has not been:

- approved by the supervisor;
- submitted on Turnitin by the end of week 4;
- included in the Appendix of your Dissertation / Project.

Student and Course Details



1. Student's Name and Surname *

Roman Shrestaha

2. Student's Ulster University ID *

- Begins with B00 followed by 6 numbers.
- It can be found on your CAS letter or BlackBoard.

B01009379

3. Student's Ulster email address *

- Do NOT include your personal / private email address

Shrestha-R5@ulster.ac.uk

4. Course Studied: *

- MSc International Business
- MSc International Business with Advanced Practice
- MSc International Business with Data Analytics
- MSc International Business with Data Analytics with Advanced Practice
- MSc International Business with Human Resource Management
- MSc International Business with Human Resource Management with Advanced Practice

-
- MSc Human Resource Management
 - MSc Human Resource Management with Advanced Practice
 - MSc Health Promotion and Public Health

5. Year of Study * 

- This is the academic year when you started your course

- 2022 / 23
- 2023 / 24
- 2024 / 25
- 2025 / 26
- 2026 / 27
- 2027 / 28

6. Attendance * 

- Full Time
- Part Time

Research Details 

7. Title of your Dissertation / Project: * 

- An indicative but close to the specific topic researched title would suffice at this stage.

Assessing Service Quality and Its Influence on Customer Satisfaction in a SaaS Context: A Case Study of Pragati IT Solution, Nepal

8. Name of Supervisor:

- This will be communicated to you at the start of your Dissertation / Project.
- You will have to return to the Ethical Approval Form at the start of your Dissertation / Project to enter the name of your Supervisor.
- Once you submit the Ethical Approval Form you will be given the opportunity to save a link which will allow you to return to the form and update it.

Dr Lorraine Limbrick

9. Dissertation / Project Type *

- Undergraduate (UG - BA / BSc / BEng / etc)
- Postgraduate (PG - MA / MSc / MEng / etc)

10. Summary of Proposed Research *

Provide short answers (1-2 sentences per bullet point) for the following:

- What is your research all about?
- Which company and/or industry will the research focus on?
- What is the issue you intend to investigate?
- What is the international business aspect you intend to focus on?
- How will you be collecting your primary data?
- How will the data collected be analysed?
- What form will your recommendations take?
- Who will benefit from the outcomes / recommendations from your research and how?

1. This research is all about evaluating the service quality and its impact on customer satisfaction.
2. The focus company/ industry of the research is Pragati IT Solution from Nepal/ SaaS Industry.
3. I want to examine the service quality and satisfaction level of the B2B customers of Pragati IT Solution.
4. The company wants to expand internationally, and this study helps to set a service quality benchmark for desired customer satisfaction.
5. I am planning to collect data from a survey questionnaire.
6. I am planning to use Python and other data analysis tools for data analysis.
7. I will share findings with the company as suggestions.

11. Start Date of Primary Research

- On which date do you intend to **start collecting primary data** for your dissertation / project?
- This is NOT the start date of your dissertation / project.

22/09/2025



12. End Date of Primary Research

- On which date do you intend to **stop collecting primary data** for your dissertation / project?
- This is NOT the submission date of your dissertation / project.

12/12/2025



13. Does your Proposed Research involve **Deception** of Participants? *

- i.e. have participants been 'deceived' or 'lied to' into participating in the research study?

Yes

No

14. Does your Proposed Research involve **Inducements** to Participate? *

- i.e. have participants been offered a 'prize' for agreeing to participate in the study?

Yes

No

15. Does your Proposed Research involve any Possible **Psychological Stress**? *

- i.e. will you be asking about potentially 'uncomfortable' or 'sensitive' personal issues?

Yes

No

16. Does your Proposed Research involve any other **special circumstances**? *

i.e. will you be asking about medical records, involvement in crime, or other similar?

Yes

No

17. Regarding Questions 13 to 16: * 

If any one or more answers to questions 13 to 16 are "**yes**":

- Provide details regarding how you will deal with these issues.

If all your answers to questions 13 to 16 are "**no**":

- Enter N/A below.

N/A

18. Please indicate who will the likely participants involved in the research be: * 

- Click all that apply

Professionals (in general)

Professionals (industry/company specific)

Retirees (in general)

Retirees (industry/company specific)

Children (under 18 years old)

Adults

The Elderly

Vulnerable Groups

People with a learning disability

People from Ethnic or other Minorities

Other

19. Please provide details of the likely participants involved in the research as identified in Question 18: * 

Participants will be involved in this data collection, mostly IT professionals, administrators, and decision makers of the schools and colleges.

20. You are expected to undertake **Primary Research**. How will data be collected? *

- Click all that apply

Questionnaire (Online)

Questionnaire (Face-to-Face)

Interviews (Online)

Interviews (Face-to-Face)

Observations

Focus Groups

Field Research

Other

21. Regarding the primary research method indicated in Question 20 for the collection of primary data for the proposed research: *

- Provide details and justification for the method selected.
- Include sample questions for the questionnaire/interview routines.

To collect primary quantitative data, this study will utilise a well-structured survey questionnaire based on the SaaS Qual model (Lederer et al., 2013), which is a widely accepted and validated model to study service quality and customer satisfaction in the SaaS environment. This instrument measures service quality through key dimensions: reliability, responsiveness, usability, security, and customer support. The survey questionnaire will comprise closed-ended statements and measures on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to convert responses of Pragati IT Solution's SaaS users into a quantitative form. Examples of survey items are as follows:

- The SaaS platform consistently works without any bugs.
- Customer support provides adequate support.
- This system's user interface is easy to use.
- The data is well-protected and secured within the system.
- The system is well-suited to the organisational change needs.

An additional open-ended question will also be provided to collect qualitative feedback or elaboration on any particular issues, which will be analysed if needed.

The survey will be conducted via online platforms for participants who are using the SaaS service from Pragati IT Solution. Responses will be anonymised, stored securely, and analysed ethically to maintain data integrity and security protocols. The survey format will be easy to administer, broad reach and be efficient for quantitative data collection.

22. When undertaking primary research, **Informed Consent** of all Participants must be obtained before any participant enters the research and **NO** participant should be engaged or approached to take part in the research without obtaining their informed consent first. All participants must be '**informed**' of the purpose behind the research using an Information Sheet, either on paper or online, and must '**consent**' prior to participating in the research. *

- Indicate below how will informed consent be obtained.
- Click all that apply.
- If informed consent does not need to be obtained, click on the 'other' option below and provide justification why this may be so.

Questionnaire: Information on the research will be provided to the participants at the top of the questionnaire and the first question will ask the participants to confirm or reject consenting prior to answering any of the questions.

Interview: Information on the research will be provided to the interviewees using an Information Sheet and the standard Consent Form will be used which every interviewee will have to sign prior to the start of the interview.

Focus Groups: Information on the research will be provided to the members of the focus group using an Information Sheet and the standard Consent Form will be used which every member of the Focus Group will have to sign prior to the start of the discussion.

Observations: Information on the research will be provided to the company manager(s) using an Information Sheet and the standard Consent Form will be used which has to be signed by the manager(s) responsible for the area of the specific company where the observation will be done.

Other

Confidentiality of Data

(4)

23. Have steps been taken to ensure Confidentiality of Data? *

Yes

No

24. What steps will be taken to ensure confidentiality of data collected? *

- Rationale for anonymity and data storage, etc
- Click all that apply

Participants will remain anonymous.

All data collected will be stored in a password protected folder in my laptop.

All data collected will be destroyed not later than 12 months after the research is completed.

Other

25. Declaration by the Student: *

I confirm that:

- I have provided the above information honestly and to the best of my ability.
- I have read and understood the Research Ethical Guidelines and agree to abide by them in conducting my dissertation / business project.
- I understand the importance of adhering to the Research Ethical Guidelines and I am aware of the penalties for breaching them.
- I agree to notify my academic supervisor if there is a change to my dissertations / project and/or further ethical approval is needed.
- I confirm that I will share all details of data received from respondents with my supervisor who will ensure this will not be shared further.
- I will report all data and findings in a responsible way.
- I will refrain from plagiarism, deception or the fabrication or falsification of results or any other action that could be interpreted as research misconduct.

To the best of my knowledge, I confirm that:

- There is no risk to any participants.
- There is no risk to me.

-
- There is no risk to the institution or QA in terms of liability or reputation.

I Confirm

I decline

26. Date the Ethical Approval form was completed or updated by the Student

28/09/2025



Supervisor's Section - Review and Decision **(DO NOT FILL IF YOU ARE A STUDENT)**



- This section must be filled only by the supervisor or the Dissertations' / Business Projects' Coordinator

27. Supervisor's Name:

Dr Lorraine Limbrick

28. Decision and Declaration from Supervisor:

I confirm that:

- I have reviewed the above information provided by the student
- I have discussed my evaluation of the contents of the Ethical Approval Form with the student
- I have reached the following decision on the ethical direction of the student's dissertation / Business Project:

Approved

Updates / clarification required

Rejected

29. Date the Ethical Approval Form was approved by the Supervisor:

13/10/2025





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Source: University of Ulster (Research Supervisor, Dr. Lorraine Limbrick)

Appendix: 4.1 Sampled Dataset for Analysis

SN	Duration	R1	R2	R3	R4	R5	Res1	Res2	Res3	Res4	Res5	Re11	Re12	Re13	Re14	Re15	F11	F12	F13	F14	F15	Fe1	Fe2	Fe3	Fe4	Fe5	satisfaction
5	4	3	2	1																							
Founder/ Principal	Account	IT	IT																								
School Management	School Management	School Management,																									
Daily	Daily	Weekly	Daily																								
More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	
4	4	5	2	5	5	4	4	2	2	4	4	4	4	4	4	4	4	5	5	4	4	4	4	4	4	4	
3	3	2	4	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
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4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
4	4	4	5	5	5	5	4	4</td																			

15	14	13	12	11	10	9	8	7	6
Account	Founder/ Principal	Administration	Founder/ Principal	Founder/ Principal	Founder/ Principal	Founder/ Principal	Vice-principal	Vice-principal	Administration
School Management,									
Daily									
1. At 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years
4	5	4	4	4	4	4	4	4	4
3	5	4	4	2	3	4	4	3	3
3	5	4	4	4	3	5	4	3	4
4	5	5	5	5	4	4	4	5	5
4	5	4	5	4	3	5	4	4	5
3	4	4	4	4	3	4	2	4	4
4	5	4	4	4	3	4	4	4	5
4	4	4	5	4	2	4	4	4	4
3	4	4	4	4	3	4	3	3	5
4	5	4	5	3	2	4	3	4	5
5	4	3	5	3	3	5	4	4	4
4	4	4	4	4	3	5	4	4	5
4	4	4	4	4	3	4	4	3	4
4	4	4	4	4	3	4	4	4	5
3	4	4	4	4	2	4	4	3	4
4	4	3	4	4	3	4	4	3	4
3	4	4	4	4	3	4	4	3	4
3	4	3	5	4	2	5	4	4	4
4	4	4	4	4	3	4	4	4	5
3	4	4	4	4	2	4	4	4	4
3	4	4	4	5	3	5	4	4	4
4	4	3	4	4	3	4	4	4	5
4	4	3	4	4	3	4	5	4	4
4	4	3	4	4	3	5	4	3	4
4	4	4	4	4	3	4	4	4	4
3	4	3	4	4	4	5	4	4	4
3	4	3	4	4	3	5	4	4	4
3	4	4	4	5	3	4	4	4	4
4	4	3	4	4	3	4	5	4	5

25	24	23	22	21	20	19	18	17	16
Administration	Administration	IT	Founder/Principal	Account	Administration	Administration	Administration	Founder/Principal	Teaching
School Management,	School Management								
Daily	Daily	Weekly	Daily	Daily	Daily	Daily	Daily	Daily	Monthly
More than 3 years	More than 3 years								
5	4	5	5	4	5	4	5	4	4
4	3	4	5	3	3	3	4	3	5
5	4	4	5	4	5	4	4	4	4
5	4	4	5	5	5	5	5	4	4
4	4	4	5	4	5	4	4	4	5
4	4	4	5	5	5	4	5	4	4
5	4	4	5	4	5	5	5	5	4
4	4	4	5	4	5	4	4	4	2
5	4	4	5	3	4	4	3	3	4
4	4	4	5	4	4	4	3	2	2
4	3	4	5	2	4	3	4	3	2
5	4	4	5	3	4	4	4	5	4
5	4	4	5	4	5	4	3	3	4
5	4	4	5	4	5	4	4	4	3
5	4	4	5	3	5	4	5	4	4
5	4	4	4	4	5	4	4	3	2
5	4	4	4	4	4	4	4	4	2
5	4	4	5	4	5	5	5	5	3
5	3	4	5	5	4	4	3	3	2
5	4	4	5	4	4	3	3	4	3
5	4	4	5	4	5	4	3	3	2
5	4	4	5	4	4	4	4	4	4
5	4	4	5	4	4	4	4	5	3
4	3	4	5	3	3	4	3	4	3
4	4	4	5	4	4	4	3	5	2
4	4	4	5	3	3	4	4	3	3
5	4	4	5	3	4	4	3	4	3
5	3	3	4	4	4	4	3	4	4

35	34	33	32	31	30	29	28	27	26
Founder/ Principal	Vice-principal	Founder/ Principal	Founder/ Principal	Account	Account	Vice-principal	Administration	Founder/ Principal	Founder/ Principal
School Management	School Management	School Management,	School Management,	School Management,	School Management,	Vice-principal	School Management,	School Management,	School Management
Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
6 months, Åi 1 year	More than 3 years	More than 3 years	More than 3 years	1 ,Åi 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	6 months, Åi 1 year
5	4	4	4	4	4	5	4	4	5
3	3	3	4	2	3	3	3	3	3
3	3	4	4	4	3	5	3	4	3
4	5	5	4	5	4	5	5	3	4
5	4	4	4	4	4	5	4	4	5
4	4	5	2	4	3	5	4	4	4
4	4	4	4	4	4	5	4	4	4
4	4	4	4	4	4	4	4	4	4
3	3	3	3	4	3	4	3	3	3
4	4	4	3	3	4	4	4	4	4
5	4	2	4	3	5	4	4	2	5
5	4	3	4	4	4	5	4	3	5
4	4	4	4	4	4	5	4	4	4
5	4	3	4	4	4	5	4	3	5
3	5	4	4	4	4	5	4	2	3
4	3	4	4	4	4	4	3	4	4
4	3	4	4	4	3	5	3	4	4
5	4	4	4	4	3	5	4	4	5
4	4	5	4	4	4	5	4	4	4
5	4	4	3	4	3	4	4	3	5
4	4	4	4	4	4	4	4	4	4
3	4	4	5	4	4	4	4	4	3
3	3	3	4	3	4	3	3	3	3
4	4	4	4	4	4	4	4	3	4
3	4	3	4	4	3	3	4	3	3
4	4	3	4	4	3	3	4	2	4
5	4	4	5	3	4	4	4	4	4

45	44	43	42	41	40	39	38	37	36
Account	Administration	Founder/ Principal	Founder/ Principal	Administration	Founder/ Principal	Administration	Founder/ Principal	Administration	Administration
School Management,									
Daily									
More than 3 years									
5	4	4	4	4	4	4	4	4	4
5	3	4	2	3	3	2	2	4	3
4	4	4	4	4	4	4	4	4	4
5	4	4	5	5	4	5	5	4	5
4	4	4	4	4	4	4	4	4	4
4	4	2	4	5	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4
5	4	4	5	4	4	4	4	4	4
4	4	3	2	3	4	4	4	4	4
5	4	3	4	4	4	3	3	4	4
3	3	4	5	2	3	3	3	4	3
4	4	4	4	3	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4
4	4	3	4	4	4	3	3	4	4
4	4	4	5	3	4	4	4	4	4
3	3	4	4	3	4	4	4	4	4
3	4	4	3	4	4	4	4	4	4
4	4	4	3	4	4	4	4	4	4
4	4	4	3	4	4	4	4	4	4
5	3	4	4	5	3	4	4	4	4
5	4	3	4	4	4	4	4	4	3
4	4	3	2	4	4	4	4	4	4
4	4	4	3	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4
5	4	5	4	4	4	4	4	4	4
5	3	4	3	3	3	3	3	4	4
5	4	4	3	4	4	4	4	4	4
4	4	4	3	3	4	4	4	4	4
4	4	4	4	3	4	4	4	4	4
4	3	5	4	4	3	3	3	3	4

55	54	53	52	51	50	49	48	47	46
Administration	IT	Founder Principal	IT	Administration	Administration	Administration	IT	Founder Principal	IT
School Management,	School Management	School Management							
Daily	Daily	Weekly	Daily	Daily	Daily	Daily	Daily	Daily	Daily
More than 3 years	More than 3 years	More than 3 years							
4	4	4	4	5	4	4	4	4	4
4	4	3	4	3	4	3	4	3	5
4	4	4	2	4	4	4	2	4	5
5	4	5	2	5	5	4	2	5	5
5	5	4	2	5	5	4	2	4	5
4	3	5	4	4	4	4	4	5	5
4	2	4	4	5	4	4	4	4	5
5	1	4	4	4	5	4	4	4	5
4	4	3	4	5	4	4	4	3	5
5	3	4	3	5	5	4	3	4	5
5	5	2	2	4	5	3	2	2	5
4	1	3	3	5	4	4	3	3	5
4	2	4	3	5	4	4	3	4	5
5	3	3	2	4	5	4	2	3	5
5	4	4	3	4	5	4	3	4	4
4	5	4	3	4	4	4	3	4	5
4	4	4	3	4	4	4	3	4	5
3	3	4	3	4	3	4	3	4	5
4	2	5	2	4	4	3	2	5	5
4	1	4	2	5	4	4	2	4	5
4	5	4	3	5	4	3	4	5	5
4	5	4	4	5	4	4	4	4	5
5	4	4	3	5	5	4	3	5	5
5	4	4	3	4	4	4	4	4	4
4	3	3	3	4	4	4	3	3	5
4	3	4	3	4	4	4	3	4	5
5	5	3	4	4	5	4	3	3	5
4	4	4	5	5	4	3	5	4	4

65	64	63	62	61	60	59	58	57	56
Account	Teaching	Founder/ Principal	Administration	Founder/ Principal	Administration	Administration	IT	Founder/ Principal	
School Management,									
Daily	Monthly	Daily							
1, Äi 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	6 months, Äi 1 year
4	4	4	4	4	4	5	4	5	5
3	5	3	3	3	3	4	4	5	3
3	4	3	4	4	4	5	4	5	3
4	4	4	3	3	4	5	5	5	4
4	5	3	4	4	4	4	5	5	5
3	4	3	4	4	4	4	4	5	4
4	4	3	4	4	5	5	4	5	4
4	2	2	4	4	4	4	5	5	4
3	4	3	3	3	3	5	4	5	3
4	2	2	4	4	2	4	5	5	4
5	2	3	2	2	3	4	5	5	5
4	4	3	2	2	2	5	4	5	5
4	3	3	4	4	4	5	4	5	4
4	4	3	3	3	4	5	5	5	5
4	2	2	2	2	3	5	4	5	4
4	2	3	4	4	4	5	4	5	4
3	2	3	4	4	4	4	4	5	4
3	3	3	4	4	5	5	3	5	5
4	2	1	4	3	5	4	4	5	4
3	3	3	4	4	4	5	4	5	5
4	2	2	4	4	3	5	4	5	4
4	4	2	4	4	4	5	4	5	3
4	4	3	3	3	4	5	5	5	4
3	4	2	2	2	4	5	5	5	4
3	3	3	3	3	3	4	4	5	3
4	4	3	4	4	4	5	5	5	4
4	3	3	4	4	5	5	5	5	3
4	3	3	3	3	4	4	4	5	3
4	2	3	3	3	3	4	4	5	3
4	3	3	4	4	4	5	4	4	5
3	3	3	4	4	4	5	4	5	4
3	4	3	4	4	4	5	4	5	4
4	4	3	4	4	4	5	4	4	5

75	74	73	72	71	70	69	68	67	66
Vice-principal	Administration	Founder Principal	Account	Administration	Account	Administration	Administration	Administration	Account
School Management,									
Daily	Daily	Daily	Daily	Daily	Daily	Weekly	Daily	Daily	Daily
More than 3 years									
4	4	4	5	5	5	5	5	4	4
3	3	3	5	4	3	4	4	3	3
3	4	4	4	5	5	4	4	4	3
5	5	5	5	5	5	4	5	5	4
4	4	4	4	4	5	4	5	4	4
4	4	4	4	4	5	4	4	4	3
4	5	5	4	5	5	4	4	5	4
4	4	4	5	4	4	4	5	4	4
3	4	4	4	5	4	4	4	4	3
4	4	4	5	4	4	4	5	4	4
4	3	4	3	4	4	4	5	3	5
4	4	4	4	5	4	4	5	4	4
4	4	4	4	5	4	4	4	4	3
4	4	5	4	5	5	4	4	4	4
4	4	4	4	5	5	4	5	4	4
5	4	3	3	5	5	4	5	4	4
3	4	4	4	5	4	4	4	4	4
3	4	4	4	4	5	4	4	4	3
4	5	4	4	5	5	4	3	5	3
4	4	4	5	4	5	4	5	4	4
4	3	4	3	5	4	4	5	3	3
3	4	3	5	4	4	4	4	4	4
3	4	4	4	5	5	4	4	4	4
3	4	4	4	5	4	4	4	4	4
4	4	5	4	5	4	4	5	4	4
4	4	5	4	5	5	4	5	4	3
4	4	4	4	5	4	4	5	4	3
4	4	4	4	5	4	4	4	4	4
4	4	4	4	5	4	3	4	4	4

85	84	83	82	81	80	79	78	77	76
Founder/ Principal	Administration	Account	Administration	Founder/ Principal	Administration	Vice-principal	Founder/ Principal	Founder/ Principal	Founder/ Principal
School Management,	School Management	School Management,	School Management						
Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
More than 3 years	6 months ,Ai 1 year	More than 3 years							
5	5	5	5	5	5	5	5	5	5
4	3	4	5	4	2	4	3	4	3
5	3	4	5	5	4	4	3	5	4
4	4	5	5	5	5	5	5	4	5
5	5	4	5	4	4	4	4	5	4
4	4	5	4	4	4	5	4	5	4
4	4	5	5	5	4	5	4	4	5
4	4	4	4	4	5	5	4	4	4
4	3	3	4	5	2	3	3	4	3
4	4	3	5	4	4	3	4	4	4
5	5	4	4	4	5	4	4	5	2
5	5	4	4	5	4	4	4	5	3
4	4	4	4	5	4	4	4	4	4
4	5	5	4	5	5	5	4	4	3
4	3	4	4	5	3	4	5	4	4
4	4	4	4	5	3	4	3	4	4
5	5	4	4	5	3	4	5	4	4
5	4	3	4	5	4	3	4	5	5
5	5	3	4	5	2	3	3	5	4
4	4	5	4	5	3	5	4	4	4
4	4	4	4	5	2	4	4	4	4
4	3	4	4	5	4	3	4	4	4
5	3	3	4	4	3	3	3	5	3
4	4	3	4	4	3	3	4	4	4
5	3	4	4	4	3	4	4	5	3
4	4	3	4	5	4	3	4	4	3
4	5	3	4	5	4	3	4	4	4

95	94	93	92	91	90	89	88	87	86
Account	Account	Founder/Principal	Administration	Vice-principal	Account	Account	IT	Founder/Principal	Founder/ Principal
School Management,	School Management								
Daily									
More than 3 years	1 ,Àí 3 years	More than 3 years	More than 3 years	More than 3 years	1 ,Àí 3 years	More than 3 years	More than 3 years	More than 3 years	6 months ,Àí 1 year
5	4	4	4	4	4	4	5	2	4
5	3	4	4	3	3	3	4	3	3
4	3	4	4	3	3	5	2	4	3
5	4	4	5	5	4	5	2	5	4
4	4	4	5	4	4	5	2	4	5
4	3	2	4	4	3	5	4	5	4
4	4	4	4	4	4	5	4	4	4
5	4	4	5	4	4	4	4	4	4
4	3	3	4	3	3	4	4	3	3
5	4	3	5	4	4	4	3	4	4
3	5	4	5	4	5	4	2	2	5
4	4	4	4	4	4	5	3	3	5
4	4	4	4	4	4	5	3	4	4
4	4	4	4	4	4	4	4	4	4
4	4	4	5	4	4	4	3	4	4
4	4	4	4	4	4	5	2	3	5
3	4	4	5	5	4	5	3	4	3
4	3	4	3	4	3	5	3	4	3
4	4	4	4	3	4	4	3	4	4
4	3	3	4	3	4	4	3	4	4
5	4	5	5	4	4	5	2	5	4
5	4	4	4	4	3	4	2	4	5
4	4	3	4	3	4	5	3	4	4
4	4	4	4	3	4	4	4	4	4
4	3	4	5	4	3	5	3	4	3
4	4	4	4	5	4	3	4	5	4
4	4	5	4	4	3	4	3	4	5
4	4	5	4	4	4	4	4	4	5

105	104	103	102	101	100	99	98	97	96
Founder/ Principal	IT	Administration	IT	Founder/ Principal	Founder/ Principal	Administration	Founder/ Principal	Founder/ Principal	Account
School Management,									
Daily	Daily	Daily	Weekly	Daily	Daily	Daily	Daily	Daily	Daily
More than 3 years									
4	5	5	2	4	4	5	4	4	5
3	5	3	4	2	4	4	2	3	5
3	5	4	2	4	4	4	4	4	5
4	5	5	2	5	4	5	5	4	5
3	5	5	2	4	4	4	4	4	5
3	5	4	4	4	2	5	4	4	4
3	5	5	4	4	4	5	4	5	5
2	5	4	4	5	4	4	5	4	4
3	5	5	4	2	3	3	2	3	4
2	5	5	3	4	3	3	4	2	5
3	5	4	2	5	4	4	5	3	4
3	5	5	3	4	4	4	4	5	4
3	5	5	3	5	4	5	5	4	4
2	4	4	3	3	4	4	3	3	4
3	5	4	3	3	4	4	3	4	4
3	5	4	3	3	4	4	3	4	4
3	5	4	3	3	4	5	3	5	4
1	5	4	2	4	4	3	4	3	4
3	5	5	2	4	3	3	4	4	4
2	5	5	3	2	3	3	2	3	4
2	5	5	4	2	4	4	2	4	4
3	5	4	4	4	4	4	4	4	4
2	5	4	3	3	4	5	3	4	4
3	5	4	4	3	4	4	3	3	4
3	5	5	3	4	4	4	3	3	4
3	4	5	5	4	5	4	4	4	4

115	114	113	112	111	110	109	108	107	106
Teaching	Account	Founder/ Principal	IT	Administration	Founder/ Principal	Administration	School Management	IT	Founder/ Principal
School Management	School Management,	School Management,	School Management,	Daily	School Management	School Management	School Management	School Management	School Management,
Monthly	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years
4	5	5	4	2	3	4	2	4	2
4	5	5	4	3	2	4	3	3	2
4	5	5	4	4	2	5	4	5	5
5	5	4	3	3	2	5	4	5	4
4	4	4	3	4	4	4	4	5	4
4	5	4	3	4	4	4	4	5	4
2	4	5	2	4	4	5	4	4	5
4	4	4	2	3	4	4	3	3	2
2	5	4	2	3	3	5	4	5	4
2	4	5	3	2	2	5	4	5	5
4	4	4	3	3	3	4	5	4	5
3	4	4	3	3	3	4	4	4	4
4	4	5	3	2	2	5	5	5	5
2	4	3	3	2	3	5	4	4	3
2	4	3	3	3	3	4	4	5	3
3	4	3	3	3	3	5	5	5	3
2	4	4	1	2	4	4	4	3	4
3	4	4	3	2	4	5	3	5	4
2	4	2	2	3	4	4	3	5	2
4	4	2	2	4	4	3	4	5	2
4	3	4	3	4	5	4	4	5	4
4	4	3	2	3	5	4	5	5	3
3	4	3	3	3	4	3	4	5	3
3	4	3	3	3	4	4	3	4	4
2	4	3	3	3	4	4	3	5	3
3	4	3	3	4	4	3	4	5	3
3	4	4	3	3	5	4	3	5	4
4	4	4	3	5	4	5	3	5	4

125	124	123	122	121	120	119	118	117	116
Administration	Founder/ Principal	Teaching	Founder/ Principal	Administration	Administration	Administration	Account	Founder/ Principal	Account
School Management	School Management	School Management	School Management	School Management,					
Daily	Daily	Monthly	Daily	Daily	Daily	Weekly	Daily	Daily	Daily
More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years	More than 3 years
5	4	4	4	4	4	4	5	5	5
4	4	5	3	4	4	4	4	4	4
5	5	4	4	4	5	4	5	4	4
4	4	5	4	4	4	4	4	4	4
5	4	4	5	2	4	4	4	2	3
5	4	4	4	4	5	4	5	4	4
4	4	2	4	4	4	4	4	4	4
3	4	4	3	3	5	4	4	3	3
3	4	2	4	3	4	4	5	3	4
4	3	2	2	4	4	4	4	4	5
4	4	4	3	4	5	4	4	4	4
4	4	3	4	4	5	4	4	4	4
5	4	4	3	4	5	4	4	4	4
4	3	2	4	4	5	4	4	4	4
4	4	2	4	4	4	4	4	4	3
5	4	3	4	4	5	4	4	4	3
4	3	2	5	4	5	4	4	4	4
3	4	3	4	3	5	4	4	3	3
3	3	2	4	3	5	4	4	3	4
4	4	4	4	4	5	4	4	4	4
4	4	4	4	4	5	4	3	4	4
5	4	4	4	4	5	4	4	4	3
4	4	4	4	4	5	4	4	4	3
3	3	3	4	4	5	4	4	4	4
3	4	2	4	4	4	4	4	4	4
4	3	3	4	4	4	4	4	4	3
3	4	3	3	4	5	4	4	4	3
3	3	4	4	4	5	4	4	4	4
3	3	3	4	4	5	3	4	5	4

	129	128	127	126
Founder/ Principal	Administration	Founder/ Principal	Account	
School Management	School Management	School Management	School Management	
Daily	Daily	Daily	Daily	
6 months, Åi 1 year	More than 3 years	More than 3 years	1 Åi 3 years	
5	4	4	4	
3	3	3	3	
3	4	4	3	
4	4	5	4	
5	4	4	4	
4	4	5	3	
4	4	4	4	
4	4	4	4	
3	4	3	3	
4	4	4	4	
5	3	2	5	
5	4	3	4	
4	4	4	4	
5	4	3	4	
3	4	4	4	
4	4	4	4	
4	4	4	4	
5	4	3	4	
3	4	4	4	
4	4	4	4	
4	4	4	4	
5	4	4	3	
5	4	4	4	
3	4	4	4	
3	3	3	4	
4	4	4	4	
3	4	3	3	
4	4	4	4	
5	3	3	3	
5	4	3	3	
5	3	4	4	

Source: (Author's own work)

Appendix 4.2: Description of Responses

Questions	count	mean	std	min	25%	50%	75%	max
Ra1	129	4.26	0.69	2	4	4	5	5
Ra2	129	3.52	0.84	2	3	3	4	5
Ra3	129	3.88	0.74	2	4	4	4	5
Ra4	129	4.45	0.76	2	4	5	5	5
Ra5	129	4.19	0.7	2	4	4	5	5
Res1	129	3.97	0.72	2	4	4	4	5
Res2	129	4.22	0.58	2	4	4	5	5
Res3	129	4.01	0.76	1	4	4	4	5
Res4	129	3.58	0.75	2	3	4	4	5
Res5	129	3.82	0.83	2	3	4	4	5
Rel1	129	3.76	1.07	2	3	4	5	5
Rel2	129	3.99	0.79	1	4	4	4	5
Rel3	129	4.01	0.57	2	4	4	4	5
Rel4	129	4.09	0.8	2	4	4	5	5
Rel5	129	3.76	0.84	2	3	4	4	5
F11	129	3.84	0.62	2	4	4	4	5
F12	129	3.77	0.62	2	3	4	4	5
F13	129	3.99	0.77	3	3	4	5	5

F14	129	3.84	0.99	1	4	4	4	5
F15	129	3.81	0.87	1	3	4	4	5
Fe1	129	3.67	0.87	2	3	4	4	5
Fe2	129	3.87	0.75	2	4	4	4	5
Fe3	129	4.08	0.51	3	4	4	4	5
Fe4	129	3.95	0.78	2	4	4	4	5
Fe5	129	4.01	0.58	3	4	4	4	5
Sec1	129	4.08	0.63	3	4	4	4	5
Sec2	129	3.56	0.66	3	3	3	4	5
Sec3	129	3.8	0.64	2	3	4	4	5
Sec4	129	3.64	0.6	3	3	4	4	5
Sec5	129	3.95	0.66	3	4	4	4	5
satisfaction	129	4.02	0.64	3	4	4	4	5

Source: (Author's computation using Python 3.12.12)

Appendix 4.3: Python Notebook of Quantitative Calculations

Notebook Link: https://github.com/sh184roman/sh184roman-Assessing-Service-Quality-and-Its-Influence-on-Customer-Satisfaction-in-a-SaaS-Context/blob/a9a8b5f77ce0337e406a282663c68476b09395d2/thesis_pynotebook_for_quantitative_calculations.ipynb

Source: (Author's own work)