

Mixed-method Analysis of a Social Commerce Usability Framework

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Abstract. Due to its potential for transforming online buying experiences, social commerce, a developing form of e-commerce, has received significant interest in recent years. The purpose of this study is to investigate the dynamics of social commerce by examining its progression from traditional e-commerce and the essential components that contribute to the social commerce framework. Furthermore, the paper focuses on conducting a usability study to evaluate the effectiveness and usability of social commerce platforms, taking into account criteria such as engaging, functionality, social aspect, usability awareness, satisfaction, and learnability. This study gives useful insights into social commerce environment by employing a mixed-methods approach that incorporates qualitative and quantitative analysis. The key findings of the study highlight the significance of usability in social commerce platforms. These findings add to the body of knowledge in the field of social commerce and have practical significance for firms looking to use social commerce platforms. Furthermore, the study identifies opportunities for future research, allowing for a more in-depth knowledge of the changing nature of social commerce and its impact on consumer behavior. This study seeks to promote informed decision-making for enterprises and researchers in their quest of exploiting the potential of social commerce for greater customer experiences and increased online revenue by shining light on the theoretical and practical aspects of social commerce.

Keywords: social commerce, e-commerce, usability study, mixed-methods analysis, qualitative analysis, quantitative analysis

1. Introduction

In the digital age, social commerce, the integration of social media and e-commerce, has arisen as a transformational phenomenon. It has transformed the way people interact with brands, make purchasing decisions, and interact with their peers. Understanding the fundamentals of social commerce has become critical for businesses trying to capitalize on this powerful trend as social media platforms continue to increase in popularity and importance.

The goal of this study is to give a full analysis of social commerce, with a focus on the creation of a research framework and a usability framework. In this research is shed light on the important components that contribute to the efficacy and usability of social commerce platforms by exploring the evolution of e-commerce to social commerce. The motivation for this study is to establish a link between the research community and the usability research framework. The study aims to find insights that can improve the comprehension and practical implementation of social commerce, ultimately helping businesses and researchers take advantage of its potential for better user experiences and corporate growth.

In the literature review section, existing research on social commerce is conducted. This will assist in identifying gaps in current knowledge and laying the groundwork for the suggested frameworks. Building on this knowledge, the research framework that unifies six important components: e-commerce, social networks, social tools, personalization, mobile, and agent technology were presented. In addition, the usability framework that includes engaging, functionality, social aspect, usability awareness, satisfaction, and learnability were presented. The following sections of the article will go into greater detail on the literature review in section 2, research methodology in section 3, findings in section 4, Section 5 concludes the paper with limitation and recommendations for future research, providing a thorough examination of social commerce and its implications for businesses and consumers.

2. Literature Review

Before the development of e-commerce, trade was the most common method of purchasing and selling goods or services between two parties (Barter, 2023). Money is the medium of exchange. People used to trade by exchanging commodities or services before money was invented. The act of exchanging products or services is referred to as system barter. Following that, commodity money, such as bean, whale tooth, and iron nails, was formed for trading. Metal was utilised as money currency about 1000 BCE, whereas coins were invented in 700 BCE to be used as money (History of Money, 2023). Bank notes and paper money were developed and rapidly became popular due to their lower cost of production than metal. Traditional trade, based on bank notes and paper money, continues to exist today.

Electronic commerce (E-commerce), frequently referred to as e-commerce, is the act of purchasing and selling goods and services via the internet in an online marketplace. Business-to-business, business-to-consumer, consumer-to-consumer, and consumer-to-business e-commerce are the four varieties (Shahriari et al, 2015). E-commerce was first developed in the 1970s, with fundamental functions such as electronic funds transfer (EFT) and electronic data interchange (EDI). It gained popularity in the 2000s (E-commerce Timeline, 2023). Amazon and eBay have been prominent e-commerce platforms since the early 2000s (The History of Ecommerce, 2023). In 1995, Amazon launched an online bookstore and began selling digital goods, food, furniture, and other items. People can conduct online transactions through the eBay e-commerce store. Customers saved time and money by paying less and purchasing more items. They are not required to leave their homes because they can shop online from the comfort of their own homes. In 2020, there will be 2.05 billion online shoppers, and 2.14 billion in 2021. The proportion of people who shop online has increased by 4.39% (Statista, 2023). On the other hand, mobile commerce (m-commerce) is becoming increasingly popular among users (Ong and Soon, 2016). M-commerce is an aspect of e-commerce. From the palm of their hand, consumers can connect to a wireless network and explore e-commerce.

Many customers or buyers purchase products or services online, such as through e-commerce or a social networking site. This is because online shopping is more convenient than in-store shopping, allowing them to discover the best deal in less time. E-commerce, on the other hand, focuses primarily on the business process rather than the customer (Baghdadi, 2013). It is built on capabilities such as searches, one-click purchasing, and recommendation that are based on the customer's previous shopping history. Furthermore, a lack of interaction between customers and businesses may discourage buyers from purchasing a product. Customers rate products based on limited information because e-commerce only permits one way browsing, from business to customer. As a result, customers' trust in businesses may erode. The global e-commerce cart abandonment rate is 66.80% in 2020 and 69.82% in 2021. Some of the causes include a complex checkout procedure, a product that is not compelling enough to purchase, and a lack of support (Huang and Benyoucef, 2012). The combination of social media with e-commerce is known as social commerce. This project will build a research framework for social commerce, which will contribute to the burgeoning social commerce research topic, specifically the user experience field. Social commerce may be a better way to handle e-commerce problems. In practise, the contribution would spark a new wave of social commerce growth as a way to boost online revenue.

In general, E-commerce and social commerce differ in various ways (Baghdadi, 2013). The distinctions can be highlighted in various aspects such as company objectives, customer interaction, and system interaction. E-commerce is concerned with business processes that improve the effectiveness of system functions such as searches, one-click purchasing, and tools that track previous shopping behaviour of customers. Social commerce, on the other hand, places a greater emphasis on social objectives such as engagement, collaboration, and user-created content sharing, with a lesser emphasis on online purchasing.

The next part is customer contact. Typically, customers deal with e-commerce shopping alone, separately from other customers. There is no interaction between consumers or between businesses. However, social commerce includes online groups with social interaction to promote consumer involvement. Furthermore, for system interaction, e-commerce is one-way surfing, which means that the online buying information is only delivered to the client; the information is rarely returned to the firm or other customers for assessment. In terms of social commerce, it adds more communication and discussion functions to allow customers to share and review information jointly with other customers and businesses.

Usability is a crucial factor in making a product, such as a website or software, useful and of high quality (Aziz, 2013). Web site evaluation is the process of determining the quality of a website. There are several aspects or features that influence the quality of a website or programme. There are several usability model or framework is created for usability testing which are Nielson Model, Jabar Model and Website Usability Model (WUM) Model.

The Nielsen Model consists of five usability variables which are learnability, efficiency, memorability, error and satisfaction (Madan & Kumar, 2012). The concept classified into two categories which are practical acceptance and social acceptance. Jabar et al. (2013) suggested a usability model that included a dependent variable (usability) as well as an independent variable (university website). The model covers elements including attractiveness, efficiency, controllability, learnability, and helpfulness that can be used to guide and measure the usability of university websites. The WUM Model incorporates 43 measurable criteria organised into eight quality sub-characteristics (Hussain, 2014). The aim of WUM is to examine and determine the strength of a website's usability, taking into account variables such as accessibility, navigation, multimedia, and more.

3. Methodology

3.1. Social Commerce Research Framework

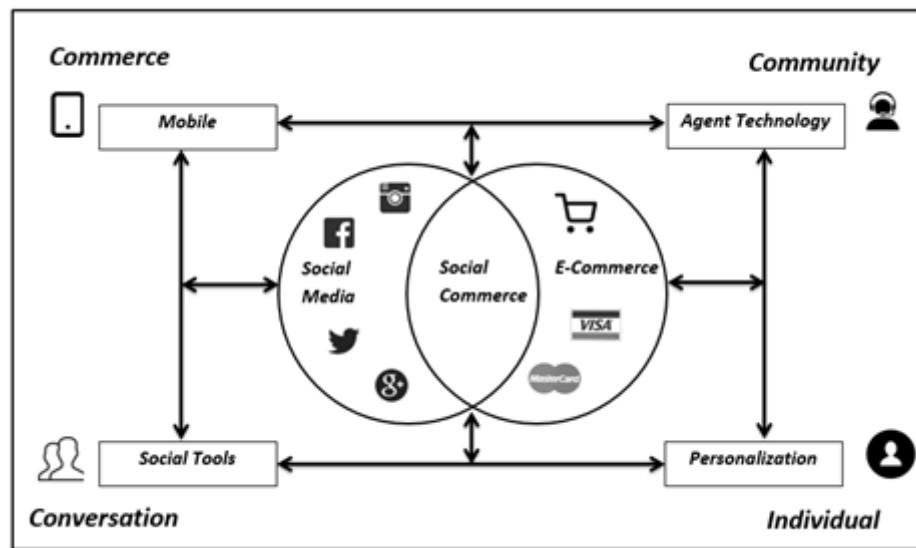


Fig. 1: Proposed Research Framework

This paper proposes a self-developed research framework for social commerce, shown in Figure 1. There are six key features: e-commerce, social networks, social tools, personalization, mobile, and agent technology. The four predetermined components of social commerce, such as community, communication, commerce, and person, embrace these aspects (Curty and Zhang, 2011).

The principles of e-commerce serve as the foundation for social commerce, which facilitates online purchase. The presentation of products plays a vital role in attracting users and providing them with the necessary details. Users can add preferred goods to their shopping carts and proceed with the checkout procedure by clicking on them. The next step is to make a secure online payment with a variety of ways such as credit cards, debit cards, or alternative payment choices. The loading time of websites is very important in the world of e-commerce. Slow-loading e-commerce websites limit customers' browsing experiences and negatively impact their purchasing decisions (Cart Abandonment, 2023). Furthermore, the use of e-commerce platforms should prioritize simplicity and demand the least amount of work. On the other hand, the guest checkout capability would be useful for purchasers who do not want to create a new account in order to make an online purchase. To avoid shopping cart abandonment, the shipping and delivery policy should be clearly specified, and an automated calculating feature should be in place. This is because no buyer wants "surprises" for additional surcharges of various prices.

Social media serves as a channel of contact between seller and buyer (Sensuse et al., 2017). Social media platforms give people and businesses a way to communicate and exchange ideas, content, and knowledge. This enables businesses to connect with a larger audience for marketing purposes and to get feedback from the general public (Ng et al., 2022). Buyers can leave comments and exchange information, and they can also review and feedback on things purchased by other users. The connectivity improves buying decision making. For sellers, it appears to be an efficient advertising technique for attracting more customers, in addition to providing more appealing material. When businesses can identify buyer behavior through remark and response analysis, a strategic advertising tool can lead to greater sales. An investigation to examine the effect of Instagram indicated that the "follower" function enabled users to stay up to date with their favorite accounts (Sensuse et al., 2017). The "follow" mindsets has a significant impact on the social group of other people, which is known as herd behavior. This phenomenon allowed purchasers to measure their tendency to buy based on the

seller's popularity.

Trust has a strong connection to customer engagement, it is a critical issue that must be addressed in the social tools feature (Hammouri and Abu, 2017). Social tools, such as comments, reviews, messages, and feedback, are social supports that are present in e-commerce and are beneficial in generating online word-of-mouth. Social support is classified into two types: emotional support and informational assistance. The former is a caring and encouraging act in which suppliers communicate with buyers via an instant messaging network. Using this method, sellers can answer quickly to questions and encourage consumers to buy right away. Offering immediate support could boost the client relationship. The latter refers to blogs, forums, and recommendations that assist buyers in making purchasing decisions. If the purchasers are concerned about their privacy when communicating via instant messaging, this is an option. Information richness may boost purchasers' confidence in the goods, particularly in Canada, the United States, the United Kingdom, and Iran, hence increasing trust in e-commerce (Hammouri and Abu, 2017).

Personalization can enhance the online buying experience of buyers (Curty and Zhang, 2011). Buyers would receive reminders about items, promotions, and offers as a result of personalization. The push notification technology, as used by eXtra Electronics, is a successful seller marketing strategy (Push Notification, 2023). However, these businesses encountered difficulties due to a lack of traffic, customer purchase, sales, and shopping cart abandonment as a result of using email as a personalization method to notify their client base. The emails are more likely to be forwarded directly to the spam or trash bin. Many customers do not read trash emails, therefore they lost out on the promotion news. After these businesses deployed push notifications, the click-through rate increased. The number of visitors, returning visitors, and buyer purchase rate has more than doubled. Shopping cart abandonment rates have also decreased. Furthermore, personalization includes elements such as a calendar, shopping lists, and product comparison, all of which attempt to make shopping more organized and simpler.

In 2021 and 2022, there will be 4.7 billion and 5.0 billion smartphone users worldwide, respectively. Because of availability and convenience, penetration increased by 5.91% (Statista, 2023) (Khaliq, 2018). As a result, an e-commerce website should be accompanied by a mobile commerce (m-commerce) application. Companies who fail to create mobile-friendly applications will lose customers. Users nowadays purchase on their cellphones, and desktop or laptop computers have become inconvenient due to their big size. The spread of mobile technologies and applications implies a new opportunity for organizations to attain better success today.

Agent technology is an intelligent bot that is being proposed for integration into the social commerce architecture. The goal is to automate the buying process such that it is faster and more dependable (Zeng, 2009). Agent technology would be able to analyse the obtained user behavior data to help make an informed purchasing decision. On the seller's side, the agent can immediately respond to buyer inquiries and assist with the purchase transaction. As a result, buyers save a significant amount of time waiting for the seller's response. The agent could also help to streamline the e-commerce system by providing buyers with personalized information and services. The use of agent technology elevates e-commerce to the next level of customer engagement.

3.2. Usability Framework

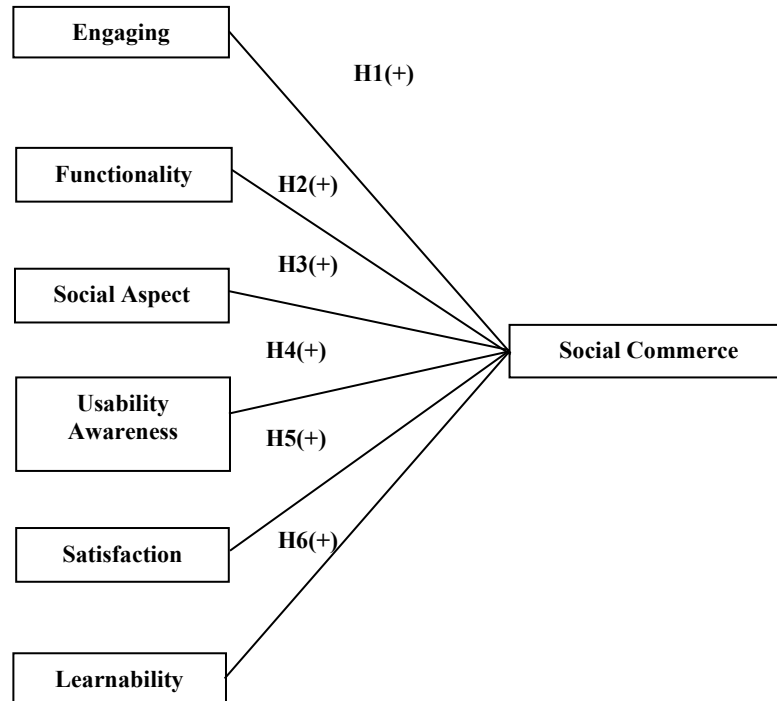


Fig. 2: Usability Framework

Figure 2 shows the usability framework implemented in this study. It aims to conduct a usability study on the utility of the proposed social commerce. The usability methodology developed for this study provides comprehensive assistance in assessing and improving the usability of social commerce platforms. Usability testing is an effective method for assessing the usability and user experience of websites, apps, and digital products (Hotjar, 2023). Real users are being monitored as they interact with the product and attempt to fulfil specific activities. These exams are carried out in person or remotely by researchers, who are commonly hired by businesses. Usability testing involves observing how consumers interact with a website, app, or other digital product to assess its usability and identify any problems or potential changes.

Typically, testing involves providing users specific tasks and collecting qualitative and quantitative data about their interactions, feedback, and satisfaction. The usability framework consists of six important independent variables that determine the usability of social commerce platforms: engaging, functionality, social aspect, usability awareness, satisfaction, and learnability. Engaging in usability studies emphasizes the significance of designing interfaces that are enjoyable, fulfilling, and engaging to use, increasing user engagement and motivation in social commerce (Whitney Quesenbery, 2004). Functionality includes things like how simple it is to navigate, find information, and make transactions, with a focus on satisfying user demands and improving the overall user experience (Element Three, 2020). The social aspect highlights the importance of user-friendly design, clear navigation, and efficient feedback mechanisms for fostering a pleasant user experience and boosting customer satisfaction (Anwar and Kwoka, 2012). Usability awareness emphasises the need of knowing and executing usability practises, as organisations with high levels of usability maturity lead to user-friendly systems and superior user experiences (Ashraf et al., 2018). Satisfaction is an important usability quality that analyses users' pleasantness in using a system, especially in non-work contexts, and is often quantified through questionnaires to obtain users' opinions (Jakob Nielsen, 2009). Learnability is concerned with how readily and fast users can gain competency in using a new system, taking into account both the time required to attain total mastery and the time required to get a sufficient level of proficiency to conduct productive work (Jakob Nielsen, 2009).

3.3. Hypothesis Formulation

Hypotheses in social science research serve as preliminary answers to research questions and as a benchmark for evaluating study findings (Senthilnathan, 2017). Social scientists rely on comprehensive knowledge of the investigated area as well as data from previous study to produce hypotheses that address social problems and occurrences. It is vital to recognise that a research question must be backed up by evidence. Hypotheses are essential to the design, direction, and conclusion of social science investigations, serving as a foundation for determining additional research needs. The following hypotheses were formulated in this study:

H1: Engaging of the social commerce is positively associated with its usability.

H2: Functionality of the social commerce is positively associated with its usability.

H3: Social aspect of the social commerce is positively associated with its usability.

H4: Usability awareness of the social commerce is positively associated with its usability.

H5: Satisfaction of the social commerce is positively associated with its usability.

H6: Learnability of the social commerce is positively associated with its usability.

3.4. Research Design

Research design serves as the guiding framework for a research investigation (Creswell, 2017). It encompasses qualitative, quantitative, and mixed methods approaches. Qualitative research focuses on exploring the "whys" and "hows" of a phenomenon through methods like participant observations and in-depth interviews (djs research, 2023). It seeks subjective insights and identifies common themes through coding. Quantitative research, on the other hand, collects numerical data to understand patterns and behaviors using techniques such as surveys and interviews (djs research, 2023). It employs standardized questionnaires and statistical analysis with a focus on closed-ended questions. Mixed methods research combines both qualitative and quantitative elements to gain a comprehensive understanding (Shorten & Smith, 2017). In this study on social commerce, a mixed methods approach is adopted, utilizing questionnaires for quantitative data and professional interviews for qualitative perspectives. This integration allows for a more holistic exploration of social commerce, capturing both statistical trends and unique viewpoints.

3.5. Data Collection

3.5.1. Sampling

To gather data that aligns with the age group driving internet purchasing trends for quantitative research, 87 University students were carefully selected as the target audience for this study. This choice was based on the fact that 66% of Malaysia's internet buyers fall within the 18 to 34 age range (The Malaysian Reserve, 2022). By focusing on university students within this demographic, the study aimed to gain highly relevant insights to enhance the website's effectiveness for this particular group. In line with best practices, the study also considered the importance of selecting an appropriate participant count for quantitative research. Following the recommended guideline of approximately 40 participants, the research sought to achieve accurate results with a minimal margin of error and a high level of confidence (Nielsen Norman, 2021).

Judgmental sampling is chosen in qualitative research. Judgmental sampling is a non-random strategy in which the researcher chooses individuals based on their knowledge and experience (Form Plus, 2023). It is utilised when standard sampling is not feasible or when specific insights from qualified individuals are required. It is often used to collect specific information in market research and qualitative investigations. In contrast to random sampling, judgmental sampling is based on the researcher's expertise rather than chance. 5 health professionals were assigned different duties and completed certain actions complete on the demo social commerce website. They submitted their reviews and thoughts after receiving a briefing and undergoing a 20-minute testing session. These responses

were recorded using a series of questions. They were subjected to a qualitative examination utilising methods like word clouds to visualize their responses.

3.5.2. Questionnaire Development

In this study, a questionnaire was developed to collect data using a 5-point Likert scale. The questionnaire consisted of statements or items that were directly related to the study objectives. To distribute the questionnaire, Google Form was used. Prior to completing the questionnaire, the students received a 15-minute briefing about its purpose and details, and then they had 30 minutes to respond. The 5-point Likert scale, which is widely used in the industry, was chosen for its simplicity and ability to generate accurate quantitative data (Worktango, 2023). Participants were asked to rate their agreement or disagreement with each item on a scale of 1 to 5, where 1 represented "strongly disagree" and 5 represented "strongly agree." The Likert scale provided a structured and standardized approach to assess participants' perceptions, attitudes, or views on the provided statements. The goal of this questionnaire section was to evaluate participants' responses and gather valuable information for the study analysis. The questionnaire consisted of 38 items, categorized into engaging (8 items), functionality (6 items), social aspect (4 items), usability awareness (3 items), satisfaction (7 items), and learnability (3 items) sections. The arrangement of the questionnaire items is presented in the table below:

Table 1: Questionnaire Items

Constructs	Item	Item Descriptions
Engaging (E)	E1	The social commerce is easy to use.
	E2	I am able to find what I need in social commerce.
	E3	I enjoy using social commerce.
	E4	I found social commerce is attractive.
	E5	Social commerce has clean and simple presentation.
	E6	It is useful to communicate with other user in social commerce.
	E7	The personalization feature of social commerce is useful for me on a daily basis.
	E8	I can run social commerce on smartphone.
Functionality (F)	F1	Social commerce responds quickly to customer requirement..
	F2	Social commerce offer online help to support customer task completion.
	F3	Social commerce provides search functions.
	F4	Social commerce allow customer to track order status.
	F5	Social commerce provides useful information.
	F6	The agent technology feature in the social commerce can solve my inquiry on product and company information without others helps.
Social Aspect (SA)	SA1	If I met difficulties, I could ask the admin of MAPS-SC via social tool.
	SA 2	Social commerce provides social recommendation.
	SA3	Social commerce allow customer to respond to content posted by other customers.

	SA4	Social commerce allows customers to share experiences and knowledge on the website.
Usability Awareness (UA)	UA1	Social commerce improves my product awareness if an online community is created.
	UA 2	Social commerce increases my product awareness if customer feedback is provided.
	UA 3	Social commerce improves my product awareness if it is easy to use.
Satisfaction (S)	S1	I feel comfortable purchasing from social commerce.
	S2	I can count on the information I get on social commerce.
	S3	I will likely use social commerce in future.
	S4	I will recommend social commerce to a friend or others.
	S5	I am satisfied with the help available on social commerce.
	S6	I think using social commerce enables me to shop for products online more effectively.
	S7	The agent technology feature in the social commerce can solve my inquiry on product and company information without others helps.
Learnability (L)	L1	I know how to purchase product in social commerce.
	L2	I know how to communicate with friend and others using social commerce's social media.
	L3	I know how to post and comment using social commerce's forum..

IBM SPSS version 22 was used for data analysis, which included one-sample statistical hypothesis testing.

4. Data Analysis

4.1. Quantitative Analysis

4.1.1. Demographic Profile

The social-demographic variables obtained from the questionnaire were analyzed as a foundational step in the data analysis process. This section captured information about respondents' gender, age, internet usage, e-commerce frequency, e-commerce experience, and social commerce awareness, and the results are summarized in Table 4.1, showing frequencies and percentages. Key findings include 70.1% male and 29.9% female respondents. In terms of age, 2.3% were under the age of 20, 63.2% were between the ages of 20 and 22, and 34.5% were 23 or older. In terms of internet usage, 2.3% used it once a week, 3.4% used it 2 to 3 days a week, 11.5% used it for 1 to 2 hours a day, and the majority of respondents 82.8% used it for more than 3 hours a day. In terms of e-commerce frequency, 5.7% used it daily, 21.8% used it weekly, 62.1% used it monthly, and 9% never shop online before. In terms of e-commerce experience, 21.8% have used it for less than a year, 36.8% have used it for one year but less than three years, 25.3% have used it for three to five years, and 16.1% have used it for more than five years. Finally, when asked about social commerce awareness, 77% claimed they were aware of it, while 23% stated they were not.

Table 2: Demographic Profile

Items	Frequency	Percentage (%)
Gender		
Male	61	70.1
Female	26	29.9
Age		
Below 20	2	2.3
20-22	55	63.2
23 and above	30	34.5
Internet Usage		
Once a week	2	2.3
2 to 3 days a week	3	3.4
1 or 2 hours a day	10	11.5
More than 3 hours a day	72	82.8
E-commerce Frequency		
Daily	5	5.7
Weekly	19	21.8
Monthly	54	62.1
I never shop online	9	10.3
E-commerce Experience		
Less than 1 year	19	21.8
1 year but less than 3 years	32	36.8
3 years to 5 years	22	25.3
More than 5 years	14	16.1
Social Commerce Awareness		
Yes	67	77.0
No	20	23.0

4.1.2. Reliability Test

The reliability of a questionnaire is an important sign of the data's stability and consistency (Statistics by Jim, 2022). It is critical that the questionnaire be reliable in order to ensure the validity of the questionnaire's answers. Cronbach's alpha, a statistical measure, is commonly used to determine consistency. Cronbach's Alpha was used to show that the questionnaire was suitable and dependable for its intended purpose (Chang et al., 2023). A Cronbach's alpha value greater than 0.70 is often seen as indicating strong reliability. In our study, all of the independent variables in the questionnaire had high alpha ratings, exceeding the 0.8 threshold.

Table 3: Reliability Test

Variables	Number of Items	Cronbach's Alpha
Engaging	8	0.947
Functionality	6	0.926
Social Aspect	4	0.907
Usability Awareness	3	0.880
Learnability	3	0.894
Satisfaction	7	0.944

4.1.3. Descriptive Result

The reliability of a questionnaire is an important sign of the data's stability and consistency (Statistics by Jim, 2022). It is critical that the questionnaire be reliable in order to ensure the validity of the questionnaire's answers. Cronbach's alpha, a statistical measure, is commonly used to determine consistency. A Cronbach's alpha value greater than 0.70 is often seen as indicating strong reliability. In our study, all of the independent variables in the questionnaire had high alpha ratings, exceeding the

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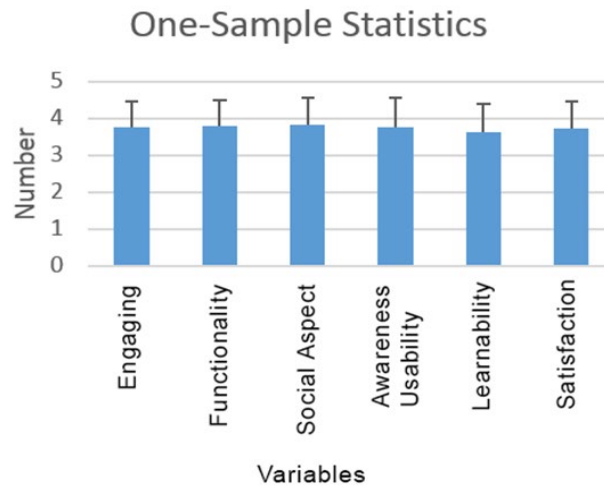


Fig. 3: One sample Statistic

Table 4: Descriptive Result (Variables)

Variables	Mean	Std. Deviation
Engaging	3.7644	.71615
Functionality	3.7989	.70808
Social Aspect	3.8190	.74386
Usability Awareness	3.7778	.79674
Learnability	3.6245	.78554
Satisfaction	3.7176	.73265

Descriptive analysis is used as the statistical approaches to summarize and characterize data such as measures of central tendency (e.g., mean, median, mode) and measures of variability (e.g., standard deviation, range) (Pestle Analysis, 2020). The descriptive results present the data collected from 87 students and provide useful feedback for the usability of social commerce across six variables: engaging, functionality, social aspect, usability awareness, satisfaction, and learnability. The students were given a 15-minute explanation of the questionnaire's purpose and details before having 30 minutes to respond.

With an average mean score of 3.7644 and standard deviation score of 0.71615, the students who participated in the survey, social commerce platforms were deemed to be very interesting. This shows that social commerce websites and applications are viewed favorably by students and are effective at grabbing their attention. Students benefit from an interesting buying experience because to the design elements, which also include appealing images, interactive aspects, and tailored recommendations.

The average mean and standard deviation score for social commerce platform functionality was 3.7989 and 0.70808, suggesting that students thought it was very functional and had all the elements needed for easy online buying. Students who were questioned generally had a positive opinion of functionality, thanks to the availability of search options, filtering techniques, simple navigation, and safe payment gateways.

An average score of 3.8 was given to the social component of e-commerce platforms, which includes elements like user reviews, ratings, and social network integration. This shows that e-commerce platforms are viewed by students as being somewhat good at promoting social interactions and knowledge sharing. Students' overall user experience is improved by the capacity to read and publish reviews, share product information with peers, and participate in discussions via social media

integration.

The usability awareness variable had a mean score of 4.3, showing that students had a strong understanding of the usability characteristics found in e-commerce systems. Students were grateful for the clear instructions, user-friendly design, and intuitive interfaces that made it easier for them to navigate and connect with the platforms. The fact that students scored highly on usability awareness indicates that they understand how important user-centered design is to improving their shopping experiences.

The mean satisfaction score was 4.0, indicating that students were generally pleased with their entire e-commerce experiences. Their satisfaction levels were boosted by the range of products, competitive pricing, ease of purchase, and timely delivery. This shows that e-commerce platforms are satisfying students' expectations for a pleasant buying experience.

The learnability variable obtained a mean score of 3.7, indicating that students thought learning to utilise e-commerce platforms was somewhat simple. While the majority of students considered these platforms to be quite simple to use and navigate, there were times when they ran across some learning curves, especially when utilising novel or unfamiliar features. The total mean score, however, indicates that e-commerce platforms provide students with a fair level of learnability.

The descriptive analysis of the survey data concludes by highlighting students' favorable evaluations of the e-commerce user experience. Students rated e-commerce platforms to be highly usable and satisfying, as well as engaging, practical, and socially interactive. But there is still potential for development in terms of making new or unfamiliar functions easier to master. These observations can help e-commerce companies improve their platforms even further so that they can satisfy the needs and preferences of student users.

4.1.4. Hypothesis Testing

Table 5: Hypothesis Testing

Variables	t	Sig. (2-tailed)
Engaging	9.955	.000
Functionality	10.523	.000
Social Aspect	10.269	.000
Usability Awareness	9.105	.000
Learnability	7.416	.000
Satisfaction	9.135	.000

The one-sample t-test is a statistical test used to determine if the average value of a sample is significantly different from a specific value (Graph Pad, 2023). The one-sample t-test was conducted with a significance level of 0.05 (2-tailed). The obtained p-values for all the factors mentioned above were less than 0.05. This indicates that these variables are indeed associated with the usability of social commerce.

The analysis revealed a significant positive association between engaging and the usability of the social commerce platform. The obtained p-value of 0.000 suggests that the observed relationship between engaging and usability is highly unlikely to occur by chance. This indicates that as the engaging elements of the platform, such as attractive design and interactive features, increase, users' perception of usability also improves. These findings support the hypothesis that engaging is positively associated with the usability of social commerce.

The findings indicate a significant positive association between functionality and the usability of the social commerce platform. With a p-value of 0.000, the observed relationship between functionality and usability is highly unlikely to be a result of random variation. This implies that as the functionality of the platform, including ease of navigation and efficient search options, improves, users' perception

of usability also increases. Therefore, the results support the hypothesis that functionality is positively associated with the usability of social commerce.

The analysis suggests a significant positive association between the social aspect and the usability of the social commerce platform. The obtained p-value of 0.000 indicates that the observed relationship between the social aspect and usability is highly unlikely to be due to chance. This implies that as the social aspect of the platform, such as user interaction and social sharing features, enhances, users' perception of usability also improves. Hence, the findings support the hypothesis that the social aspect is positively associated with the usability of social commerce.

The findings indicate a significant positive association between usability awareness and the usability of the social commerce platform. With a p-value of 0.000, the observed relationship between usability awareness and usability is highly unlikely to be a result of random variation. This suggests that when users have a higher level of awareness regarding social commerce and its functionalities, it positively influences their perception of usability. These findings support the hypothesis that usability awareness is positively associated with the usability of social commerce.

The analysis reveals a significant positive association between satisfaction and the usability of the social commerce platform. The obtained p-value of 0.000 suggests that the observed relationship between satisfaction and usability is highly unlikely to occur by chance alone. This implies that as users' satisfaction with the platform increases, their perception of usability also improves. Therefore, the results support the hypothesis that satisfaction is positively associated with the usability of social commerce.

The findings indicate a significant positive association between learnability and the usability of the social commerce platform. With a p-value of 0.000, the observed relationship between learnability and usability is highly unlikely to be due to chance. This suggests that as users' learnability in navigating the platform and understanding its features improves, their perception of usability also increases. Consequently, the findings support the hypothesis that learnability is positively associated with the usability of social commerce.

4.2. Qualitative Analysis

5 health professionals with relevant health experience and background including doctors, nurses, pharmacists, physical therapists, and health educators, were assigned different duties and completed certain actions on the tested healthcare theme website in this qualitative research study. It includes collecting subjective views and experiences from health professionals who interacted with the proposed social commerce platform's features, such as e-commerce, social media, social tools, personalization, mobile, and chatbot. It aims obtain a greater knowledge of how these experts evaluate the usability and effectiveness of the platform by analysing their qualitative feedback, which will contribute vital insights to the overall evaluation of your social commerce framework.

The time spent on e-commerce function testing varied. Viewing product information and adding goods to the cart were both short activities, allowing customers to easily browse and pick products. However, due to the requirement to input personal information and ensure secure transactions, adding user information and completing the purchase took longer.

Generally, testing social media tasks such as making comments and adding friends took less time. These activities are intended to be quick and simple, allowing interviewee to effortlessly engage with content and connect with others.

The time spent on personalization tool tasks varies. Weight tracking and BMI calculation took longer since they required specialized measurements and calculations. Using a calorie calculator and validating health items, on the other hand, were faster procedures that provided interviewee with rapid results and information.

Evaluating a mobile app's ease of use, user-friendliness, and mobile view often took less time.

Interviewee could immediately evaluate the app's UI, navigation, and mobile device optimization, providing insights about its usability.

Interacting with a chatbot (agent technology) includes duties such as asking for information, obtaining contact information, and problem-solving. While requesting information and contact information were relatively simple tasks, problem-solving could take longer depending on the complicated of the issue, necessitating interviewee to reflect and provide more extensive explanations.

Overall, task time varied according to the nature of the function and the intricacy of the actions performed. Quick jobs frequently required simple interactions or access to easily available information, whereas slower tasks demanded more input, thought, or engagement with complicated aspects. Furthermore, the device utilized, such as a smartphone or laptop, may alter the amount of time spent on specific tasks.

Table 6: Task for Interviewee

No	Testing ecommerce function	Details	Average completion time	Feedback
1	Testing e-commerce functions	1.1- Viewing Information 1.2- Add to cart 1.3- Adding User Information 1.4- Checkout 1.5- Payment	1.1- 1 Minute 1.2- 1 Second 1.3- 5 Minutes 1.4- 1 Second 1.5- 28 Seconds	1.1 Good - Detailed product info; Bad - Time-consuming to read. 1.2 Good - Quick and easy process; Bad - None. 1.3 Good - Personalized experience; Bad - Takes time to complete. 1.4 Good - Fast and straightforward; Bad - None. 1.5 Good - Various payment options; Bad - Time-consuming.
2	Testing social media	2.1- Comment 2.2- Add Friend 3.3- Create Profile	2.1- 2 Seconds 2.2- 1 Second 3.3- 1 Minute	2.1 Good - Easy feedback; Bad - None. 2.2 Good - Quick and simple; Bad - None.
3	Testing social tools	3.1- Review Blog Information 3.2- Testing Forum Features 3.3- Testing Messaging tools	3.1- 4 Seconds 3.2- 4 Minutes 3.3- 16 Seconds	3.1 Good - Accessible and informative; Bad - May take a few seconds to load. 3.2 Good - Interaction with users; Bad - Can be time-consuming. 3.3 Good - Efficient communication; Bad - None.
4	Testing personalization tools	4.1- Weight tracking 4.2- Bmi 4.3- Calories Calculator 4.4- Malaysia health products verification.	4.1- 1 Minute 16 Seconds 4.2- 48 Seconds 4.3- 14 Seconds 4.4- 18 Seconds	4.1 Good - Track progress; Bad - Takes a bit longer. 4.2 Good - Provides health insights; Bad - None. 4.3 Good - Convenient for tracking intake; Bad - None. 4.4 Good - Ensures authenticity; Bad - Takes a few seconds to verify.
5	Testing mobile application.	5.1- Easy to Use 5.2- User friendly 5.3- Mobile View	5.1- 7 Seconds 5.2- 3 Seconds	5.1 Good - User-friendly interface; Bad - None.

			5.3- 2 Seconds	5.2 Good - Intuitive design; Bad - None. 5.3 Good - Optimized for mobile devices; Bad - None.
6	Testing chatbot(agent technology)	6.1- Asking Information 6.2- Asking Contact 6.3- Solving Problem	6.1- 2 Seconds 6.2- 4 Seconds 6.3- 37 Seconds	6.1 Good - Quick responses; Bad - None. 6.2 Good - Easy contact request; Bad - None. 6.3 Good - Assists with problem-solving; Bad - Some resolution time required.

4.2.1. Interview Results

Word clouds are graphic representations of text data that aid in the evaluation of student knowledge (Depaolo and Wilkinson, 2014). Researcher can swiftly analyse word patterns to assess understanding, identify common errors, and grasp crucial concepts. They give feedback, direct examinations, and identify themes in student reflections. Word clouds are excellent for efficiently organising enormous volumes of text data. The table below show some interview answer from the 5 health professional.

Table 7: Interview Question

1. Do you find difficulty when using social commerce?
2. The health care information is sufficient in social commerce?
3. Is it easier to get complete information about product?
4. What feature need to be improve in social commerce?
5. What feature you recommend to be added in social commerce?
6. Will you continue using social commerce in future?
7. What feature you like the most in social commerce?
8. Which feature in social commerce you don't like?

The average time for each interviewee to answer all the questions was approximately 30 minutes. This indicates that, on average, interviewees took around 3.75 minutes to answer each question.

Table 8: Interviewee Answer

"Easy to use"
 "The information is sufficient"
 "Easy to get information"
 "Payment need to improve"
 "Recommend notification"
 "Will continue use social commerce"
 "Whatsapp is my favourite"
 "Like"
 "Easy to use"
 "The information is sufficient"
 "Easy to get information"
 "Customer review need to improve"
 "Recommend customer review"
 "Will continue use social commerce"
 "Customer review is my favourite"
 "Like"
 "Easy to use"

Table 9: Word Cloud



Based on the word cloud created from the interview responses, several positive aspects were highlighted in the comments regarding the usability of the social commerce. Firstly, the phrase "easy to use" appears several times in the comments, indicating that consumers found the social commerce platform to be easy to use and intuitive. Then, the statement "the information is sufficient" appears in multiple comments, implying that interviewee believed the platform provided them with all of the information they need. Additionally, the phrase "Easy to get information" emphasizes the ease with which information can be obtained on the social commerce platform.

However, interviewee identified several areas for improvement. Some interviewee said "payment needs to improve," "customer reviews need to improve," "social tools need to improve," and "appearance needs to improve." These comments suggest that consumers noticed specific parts of the experience that may be improved. Moreover, interviewee suggested things like "recommend notification," "recommend customer review," "recommend task reminder," and "recommend live chat." These proposals are for enhancements or functionalities that people believe will improve their platform experience.

In terms of user preferences, many interviewees stated that they intend to continue utilising social commerce. Some interviewee also mentioned their favorites tools or features, such as "Whatsapp is my favorite," "Customer review is my favorite," "Personal tool is my favorite," and "Chatbot is my favorite." Furthermore, the phrases "Like" and "Dislike" were used to express interviewee' positive and negative feelings about various parts of the site. Some individuals gave specific input, such as "dislike social network," "dislike blog," and "dislike virtual assistant." These comments indicate their preferences or areas where they were dissatisfied.

Overall, the word cloud analysis indicates that interviewee considered the site to be simple to use and valued the abundance of information. There were also suggestions for particular areas of development and suggestions for improving the user experience. Interviewee stated that they intend to continue using social commerce and identified their favorite tools or services. Users' preferences and areas of unhappiness are revealed via their likes and dislikes. These observations form the basis for additional thematic analysis to investigate the underlying themes and patterns in the qualitative data.

4.3. Summary

Overall, the combination of quantitative and qualitative study offers insightful data on how users view the usability of social commerce. While questionnaire responses from the quantitative analysis indicated the participants' views and preferences, the qualitative analysis revealed specific time variations for various tasks. These results provide a complete picture of the user experience by highlighting the positive aspects of the social commerce platform's usability as well as its areas for growth.

5. Conclusion

Despite the useful insights gained from this research, a few limitations should be addressed. The study focused on a narrow demographic and geographical area, which may restrict its applicability to a larger population. The results might not apply to a bigger and more diversified population in general. More study involving varied demographics and circumstances would improve the results' external validity. This would increase the applicability of the results and give a deeper understanding of how various demographics interact with the website.

Several possibilities for future research can be explored based on the findings of this study. To begin, ongoing studies tracking the history of social commerce through time would provide useful insights into its long-term impact and possible modifications. Furthermore, researching the impact of cultural characteristics on social commerce adoption and usage patterns might help researchers better understand cross-cultural variances in consumer behaviour. Furthermore, future research could focus on the role of emerging technologies such as augmented reality and artificial intelligence in defining the future of social commerce.

In conclusion, this research sheds light on the evolution of e-commerce to social commerce and provides a comprehensive framework for understanding its fundamental components. The usability study emphasizes the importance of engaging, functionality, social aspects, usability awareness, satisfaction, and learnability in enhancing the usability of social commerce platforms.

Quantitative findings support the hypothesis that the six variables positively associated with the usability of social commerce. The examination of the survey data shows that students view e-commerce platforms as being very user-friendly, entertaining, useful, and socially interactive. These results confirm the value of using these variables in the planning and creation of social commerce platforms. The qualitative findings provide additional insights into social commerce usability. According to the study, task duration varied according to the degree of difficulty of the actions taken, the function involved, and the type of device being utilised. Slower jobs required more input and involvement with complicated elements while quicker tasks often required simple interactions or access to easily accessible information.

However, it is vital to recognise the study's limitations, such as a narrow demographic and geographical area. Despite these limitations, the findings add to the expanding body of research in the subject of social commerce and provide useful insights for organisations looking to capitalise on its potential. To deepen the understanding of this dynamic and fast growing phenomenon, future research should address the mentioned limitations and explore new facets of social commerce

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