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PRIMARY RESEARCH

Comparison of e-commerce interfaces based on satisfaction and efficiency

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Keywords

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Abstract

The use of the internet has increased, and it has become essential in many aspects of life, and among the other uses, e-commerce has been the most successful. The usability level can define the criteria for judging the success of e-commerce systems after the user's interaction with these interfaces. The purpose of this paper is to compare two e-commerce systems, Amazon & Noon, in terms of satisfaction and efficiency usability, using microsoft's usability guidelines and System Usability Scale (SUS). The comparison is based on users' reviews using primary data (questionnaires). Data were collected from 120 users who participated in the two interfaces evaluation. An independent sample *t*-test was applied to measure both efficiency and satisfaction, and the experimental results of the *t*-test with 95% confidence showed that Amazon is better than Noon in terms of satisfaction and efficiency. The mean value of Amazon is 48.34, and Noon is 31.35.

INTRODUCTION

In recent years, constant expansions in information technology have led to substantial increases in internet usage and the number of websites that provide e-commerce services. e-commerce is "a newly emerging concept that describes the process of purchasing, selling, or exchanging products, services, and information through computer networks, including the internet" (Kwilinski, Volynets, Berdnik, Holovko, & Berzin, 2019).

The use of e-commerce has numerous advantages. These include cost savings, the expansion of present distribution channels, and the expansion of prevailing business models, among others. User-friendly and usability is a term used in human-computer interaction to describe how users can use a product to accomplish a particular task with satisfaction and efficiency in a particular context of usage. Usability is measured in terms of the time it takes users to complete specific tasks with efficiency and to what extent the users find it easy to access the interface with satisfaction. Many interfaces have been created and used due to the growth of an information and knowledge-based society (Tsagkias, King, Kallumadi, Murdock, & de Rijke, 2021).

Research by Shardow and Mensah (2018) focused on whether there is a need for a harmonization framework fore-commerce interfaces rather than identifying the impact of user satisfaction level, which will be given more attention in the study.

Experts did another Study by Al-mutairi and Alshamari (2020) to evaluate the implementation of persuasive design in e-commerce. However, if users were also considered, it would have been more valuable and might have provided a better conclusion on the selected interfaces. It is important to gather information from end-users as well to get more clear understanding; therefore, in this study, we will collect data from at least 120 users to evaluate related hypotheses and to figure out the answers to the following research question:

The user experience of Noon is better compared to Amazon in terms of usability criteria - satisfaction and efficiency?

One of the primary goals is to study the usability criteria of

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e-commerce interfaces to better understand the usability issues common to e-commerce interfaces through comparison. In addition, it was expected to understand how users responded to the usability criteria of satisfaction and efficiency.

The usability of two popular e-commerce stores: Amazon and Noon: satisfaction and efficiency, in terms of usability criteria is investigated in this research. The paper is structured this way. Firstly, the abstract is described, and research questions and findings are demonstrated. Secondly, the introduction consists of research gaps, questions, and objectives. Thirdly, the literature review consists of work related to interface usability. And fourthly, the research methodology, where the research design, participants, data collection processes, and materials used in the study are all described in detail. Fifthly, the statistical analysis of the data obtained and the study findings are discussed in detail. At the end of this paper, the conclusion of the research is discussed where a discussion of the limitations and recommendations for further studies.

LITERATURE REVIEW

International Standards Organization (ISO) defines usability as "the effectiveness, efficiency, and satisfaction with which specified users achieve specified goals in specific environments" (Farzandipour, Meidani, Riazi, & Sadeqi Jabali, 2018). In website design, usability refers to whether the design can meet users' needs and help them achieve their goals as quickly and efficiently as possible; that is, usability is how users describe the quality of a website based on their experience with the website (Hill, Brierley, & MacDougall, 2003). When a certain user compares the quality of a certain product with their expectations before consumption, (Li & Lee, 2016) assumes that user satisfaction is the disappointment or pleasure that occurs.

Data collected on website user behavior from two types of customer groups: traditional customers and innovative customers, to design customer services and increase customer Satisfaction. They then analyzed customer log data, such as time spent on each page, source of visit, and add-to-cart activities. They suggested adjusting the website in line with the navigational and purchasing behavior of different types of customers. Users' perceptions of the interface's efficiency and satisfaction are always at the forefront of their minds while considering its cognitive elements (Suchacka & Chodak, 2017).

In the design of e-commerce websites, one of the most serious problems identified by Díaz, Rusu, and Collazos (2017) stems from the failure of interface designers to consider Hofstede's cultural dimensions. It is critical to have a culturally sensitive interface quality to attract international and local website visitors (Díaz et al., 2017).

Hasan and Morris (2017) did a similar heuristic evaluation on both foreign and Arabic e-commerce websites to uncover usability issues in the chosen websites. Three overseas websites were used, as well as four Arab e-commerce websites. According to the study, Arab websites have more usability issues than foreign websites.

In research by Quiñones and Rusu (2019), the authors conducted a literature evaluation of 37 papers on establishing usability heuristics. They discussed the ways that various studies used to establish their heuristics. According to the findings, the most common ways for developing usability heuristics were (1) establishing new heuristics from existing heuristics and (2) based on various methodologies devised by the authors themselves; however, the strategy utilized in this thesis is comparable to the first.

A study by Shardow and Mensah (2018) suggested that a lack of usability is responsible for the failure of many e-commerce websites to attract customers to their sites. When customers have difficulty using a product, the training costs for their productivity drop and the Total Cost of Ownership (TCO) increases. Customer dissatisfaction grows as a result, and bad news is spread through the trade press, online forums, and email groups, which are detrimental to e-commerce businesses.

The affective dimension plays a crucial role in the usability criterion, although satisfaction as an integral aspect of that criterion has received little attention. It has been proposed in the Information Systems (IS) area that the emotive elements of a design, such as colors, images, and shapes, influence the overall perception of the Information System (Mazhar & Anwar, 2012; Prastawa, Ciptomulyono, Laksono-Singgih, & Hartono, 2019).

Users like to use and return to well-structured websites where they can readily discover the information they need, according to (Martinez et al., 2021).

Evaluating the usability of interfaces is critical in the system development life cycle and should not be neglected. It provides evidence of the quality and usefulness of the effort put forth in developing mobile applications and interfaces, as well as the effectiveness of the effort (Hamid, Jam, & Mehmood, 2019; Kaur & Kaur, 2019).

It is typically subjected to several usability tests to offer a new product, whether it is a commodity, service, or interface. Client discontent and business loss are reduced due to any application usability issues that may develop in the real-world application, which are minimized. De-

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signers now have more opportunities to uncover concerns through usability testing as a result of the increase in the usage of the internet and usability testing activities. As a result, mobile apps and mobile devices/gadgets are becoming more prevalent in our everyday life, and designers should take advantage of this (Ahmad, 2021). The usability evaluation process includes the following steps: planning activities, determining assessment procedures, selecting participants, performing the task, analyzing the results, and making recommendations based on the findings. In general, usability testing for mobile applications is becoming increasingly crucial (Bento, 2016). Several designers have built and tested the usability of many systems, according to some studies (Clavijo-Buendía et al., 2020).

The activity of e-shopping through mobile or web applications can only be considered effective if clients are sufficiently satisfied with their purchases and find the interface efficient to use. To guarantee acceptance efficiency, effectiveness, satisfaction, and ease of use of interfaces, the evaluation of usability in e-commerce has become a critical step. It is also an important proposal for developers looking for advice on interface design and characteristic enhancements (Martínez-López, Li, Liu, & Feng, 2020; Wanigasooriya, 2009).

METHODOLOGY

Research Question

The purpose of the study is to figure out the answer to the following question:

RQ1: The user experience of Amazon is better as compared to Noon in terms of usability criteria - satisfaction and efficiency?

Hypothesis

H1: Noon is more Efficient in terms of Usability than Amazon.

H2: Noon is more Satisfactory in terms of Usability than Amazon.

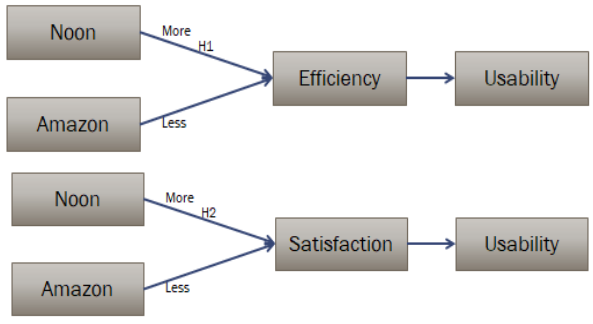

FIGURE 1. Hypothesis model

Design and Methodology

This section fully explains the methodologies used to gather the research project data. The research design for this study was to investigate users' experiences with existing e-commerce interfaces using primary data acquired through a questionnaire. The quantitative technique was used because the study aimed to better understand users' experiences with e-commerce interfaces and websites.

Inspection, testing, and inquiry are the three (3) types of usability evaluation procedures that can be used. Inspectors, software developers, users, and other professionals assess the usability-related features of a user interface using heuristic evaluation, cognitive walkthrough, or action analysis techniques as part of the Inspection technique. Performance evaluation, co-discovery learning, remote or retrospective testing, and allowing representative users to work on common tasks while using the system are all components of the testing evaluation approach to evaluation (or the prototype). On the other hand, the assessors look at the data to determine how well the user interface assists users in completing their tasks. User interviews, observation of users performing real-world tasks with the system (rather than for usability testing), and having users respond to questions verbally or in writing allow usability evaluators to gain insight into their likes, dislikes, needs, and understanding of the system. Field observation, focus groups, interviews, and questionnaires are a few research methodologies employed (Ambarwati & Mustikasari, 2021). A usability evaluation method based on an inquiry (questionnaire) was used as part of the study methodology. The questionnaire was distributed to members of the general public and to the students of Bath Spa University | Academic Center RAK, UAE, for them to answer the questions based on the criteria for usability.

Inquiry (questionnaire)

An inquiry (questionnaire) was the type of usability evaluation procedure used in this study.

The study was conducted to obtain consumer feedback on the usability of two existing e-commerce interfaces. The data for this study were collected using a survey. The participants in this study are the general public and students of Bath Spa University | Academic Center RAK, UAE, who utilize the internet as a primary source of information when purchasing online. These participants were used to enquire about the usability of these two selected e-commerce platforms in terms of satisfaction and efficiency.

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TABLE 1. Constructing survey questionnaires

Variable	Variable Categories	Questions
Demography	Population Tally	Gender Age
	Internet usage Basic Information	How often do you use the internet? What do you use the internet for?
	Using the Internet for Buying Purposes	Have you ever bought anything online before? (If yes, the respondent can proceed with filling out the questionnaire, if not, the form will be closed) On what platform did you buy the items? (The 2 platforms used for this questionnaire; are Noon and Amazon).
User satisfaction	Search related	What is the relevance of the search result? Is the search fast? How would you rate the search filter?
	Navigation	Is the interface intuitive? That is, can you use it without going through prior lessons? Were the features easy to access?
	Customer Support Service	Is it easy to interact with websites? Provides benefits for the website as well as the user.
	Successful Transaction	Does user account privacy and payment are maintained?
Efficiency	Product Categorization	Simplicity to access information and features
	Products Recommendation	It provides recommendations based on the previous search for quick execution of the task
	Time to Complete a Task	How quickly are the tasks executed?
	Easy to Navigate	Easy navigation to win or knowledge of website usage

Study Design

The study follows a questionnaire-based approach where participants were initially given an idea or a demonstration about the e-commerce platforms and then were asked to fill out the questionnaire. An analysis of the models shown in Figure 1 led to the development of a comparison to establish the dimensions of efficiency and satisfaction that each model measured. To transfer the features measured by each model into the dimensions of efficiency and satisfaction, primary data was gathered through the distribution of a questionnaire and extensive readings of the available literature. Based on the definitions of each dimension provided by Microsoft's usability guidelines and SUS, each attribute was assigned to a certain dimension of usability. Figure 2 represents the study dimensions of this paper.

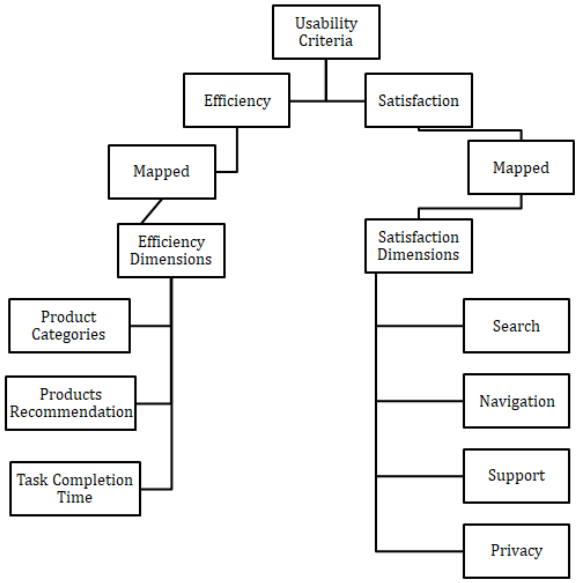

FIGURE 2. Study dimensions

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Study and Collection Procedure

The study procedure is the following: The questionnaire used in the context of this study will be divided into two sections:

a) Demographic,

b) Satisfaction and effectiveness.

Structured digital surveys were used to collect information. The questionnaire was created to gather information about users' experiences with e-commerce platforms.

The questionnaire was created and distributed to the target population using Google Forms, a free online data-gathering tool. The usage of digital surveys avoids the need for paper, lowers errors, and makes data computation and analysis easier. It is also expected that respondents would be able to respond at their leisure using the questionnaire.

Measurements and Calculation Methods

The questionnaire was divided into two sections. The first section consists of demographic questions that capture participants' age (15-20, 21-26, 27-35, 36-45, 46-above), gender (female, male), and how often they buy things Online. All study questionnaires will be designed and administered electronically using the Google Forms service. And the second section consists of the satisfaction and efficiency criteria.

The SUS questionnaire and Microsoft's usability guidelines were used to measure each e-commerce platform's usability. SUS comprises 10 questions customized to the questionnaire according to the requirement (Lewis, 2018). The user can choose between 5 possible answers on the Likert scale, from "Strongly agree" to "Strongly disagree." SUS is a questionnaire that has been rigorously validated and can be used to evaluate the usability of any software system, device, or service, regardless of its type (Purwadi, Delima, Wibowo, Toding, & Santoso, 2019).

TABLE 2. Likert scale extracts from the questionnaire

			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Amazon	Satisfaction	Search	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		Navigation	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		Support	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		Privacy	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	Efficiency	Recommendation	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		Categories	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		TasK Completion Time	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

TABLE 3. Likert scale extracts from the questionnaire

			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Noon	Satisfaction	Search	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		Navigation	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		Support	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		Privacy	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	Efficiency	Recommendation	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		Categories	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		TasK Completion Time	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

The Likert scale can be expressed as a 5-point (or 7-point) scale, which allows the respondent to express how strongly they agree or disagree with a certain proposition. When responding to a statement or question, a Likert scale (usually) provides five alternative responses, allowing respondents to indicate their level of agreement or perception about the statement or question on a nominal scale ranging from positive to negative. Table 2 and 3 represents the Likert Scale extracted from the questionnaire of Amazon and Noon.

Statistical Analysis

The data collected via the digital questionnaire was exported/downloaded from Google Forms and analyzed with Microsoft Excel and the Statistical Package for Social Sciences (SPSS version 22). Highlights of the findings will be presented alongside data analysis to clarify the findings and make drawing conclusions based on the data acquired easier.

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FINDINGS

This study invited 120 participants to evaluate the usability of e-commerce websites (Amazon and Noon). Of the 120 participants, 46 were females (38.3%), 72 (60%) were males, and 2 (1.7%) said prefer not to say. The participants were the majority of students from Bath Spa University | Academic Center, RAK, UAE, and very few were from the general public. 89 (72.4%) participants were between the ages of 15 - 220. However, 25 (20.8%) of the participants were in the age category of 21 - 26, while 2 (1.7%) participants were between the ages of 27 - 35. 3 (2.5%) of the participants were between the ages of 36 - 45. At the same time, the remaining 1 (0.8%) was between the age of 46 - above. All the study participants had a decent understanding of computer operation and Android and IOS smartphones, among other things. Along with that, all of them were familiar with the selected e-commerce Platforms (Amazon and Noon).

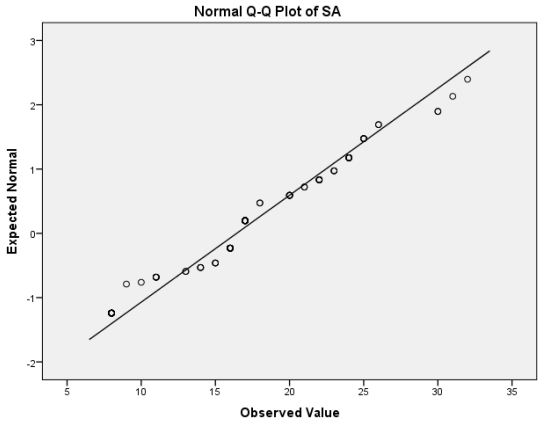

FIGURE 3. Normal Q-Q Plot

Figure 3 represents the Normal Q-Q Plot. "Normal Q-Q Plot" is a graphical method of determining the amount of normality, which means that the variable points are normally distributed. The dots represent actual data. The data is normal if the dots fall anywhere near the black line.

In the Figure, 4 data points are close to the line. If some of the data points are far from the line, it's possible that your data isn't normal. It is common practice to use a Q-Q plot, an abbreviation for "Quantile-Quantile plot," to determine whether a variable is normally distributed. If the residuals fall along a roughly straight line at a 45-degree angle, they are considered to be roughly normally distributed. This could indicate that the data presented in Figure 8 are normally distributed because they deviate significantly from the 45-degree line in the Q-Q plot shown above, particularly at the tail ends (Soikliew & Araveeporn, 2018).

Although a Q-Q plot is not a formal statistical test, it is a quick and easy way to see if the residuals are normally distributed (Liang, Fu, & Wang, 2019).

TABLE 4. Reliability analysis – Amazon

Variable	Item	Cronbach α
Satisfaction (Amazon)	8	.982
Efficiency (Amazon)	7	.978

TABLE 5. Reliability analysis – Noon

Variable	Item	Cronbach α
Satisfaction (Noon)	8	.984
Efficiency (Noon)	7	.982

Reliability analysis can be used to investigate the qualities of measurement scales and the items that make up the scales. The Reliability Analysis technique generates some regularly used scale reliability metrics and information on the relationships between individual scale items (Hernandez, 2021). Regarding internal consistency or how closely a group of items is related, Cronbach's alpha is useful. It is regarded as a reliable indicator of scale reliability. A high alpha value does not imply that a measure is one-dimensional; rather, it indicates that it is multi-dimensional. Cronbach's reliability coefficient is a measure of how reliable a system is. This indicates that the items have a relatively high level of internal consistency. The alpha coefficient for the number of items is .982 for the satisfaction of Amazon, .978 for the efficiency of Amazon, .984 for the satisfaction of Noon, and .982 for the efficiency of Noon, indicating that the items have a relatively high level of internal consistency. (It should be noted that a reliability coefficient of 0.70 or higher in most social science research situations is considered "acceptable." As a result, the reliability coefficient for each index is greater than 0.70 (as shown in Tables 4 and 5), indicating that the questionnaire is highly reliable (Das & Imon, 2016). With the help of IBM SPSS version 22, the researchers conducted the reliability analysis for this thesis.

The goal of this study's usability evaluation test was to learn about the performance and usability of e-commerce interfaces and determine whether or not users were satisfied with the interface. The test was conducted on two intended usability criteria of the e-commerce interfaces, Amazon and Noon: (1) efficiency; and (2) satisfaction.

This section further describes the study's findings, obtained through the questionnaire, Google form responses, and SPSS tests. Apart from the moderators' observations, the data analysis gave much weight to the responses of the participants because they were the ones who were directly involved in the interaction with the interfaces.

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As a result, it was thought to be crucial to evaluate their opinions about the e-commerce interface's usability. As a result, the researcher primarily relied on the questionnaire responses and comments to arrive at the study's conclusion.

Figures 4 to 7 were created by compiling the responses to the questions posed on two aspects of e-commerce interfaces, which were collected from the questionnaire. The rating Likert scale is shown in Tables 2 and 3. The questionnaire has 37 questions for each of the 120 participants to answer, one for each of the examined usability criteria of e-commerce interfaces. The participants' responses were based on a 5-point Likert scale. The mean and standard deviation were calculated using the numbers 1, 2, 3, 4, and 5 in SPSS. The results are then summarized and explained, including simplicity of efficiency and satisfaction with amazon and noon interfaces.

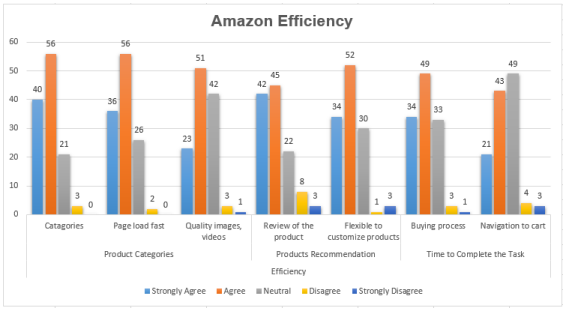

FIGURE 4. Amazon efficiency

The graphs in Figures 4 and 5 show the efficiency of Amazon and Noon; the categories of efficiency are also highlighted; product category, product recommendation, and time to complete the task. Looking at strongly agree and agree on bars, there is somehow no consistency in both the interface's responses as somewhere Amazon has high responses and vice versa.

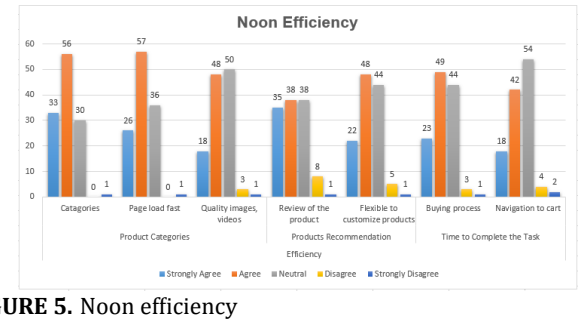

FIGURE 5. Noon efficiency

But the majority of responses, as seen in this graph, show that most people agree with the efficiency of Amazon, where it can be seen that the efficiency of Amazon is higher than Noon.

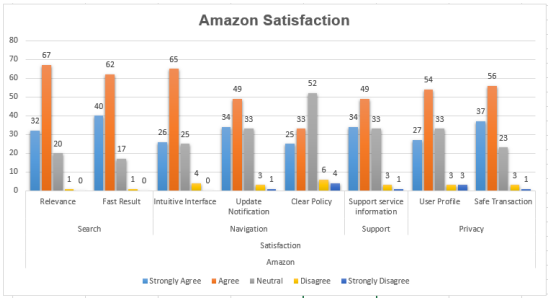

FIGURE 6. Amazon satisfaction

The graphs in Figures 6 and 7 show the satisfaction of Amazon and Noon; the categories of satisfaction are also highlighted; Search, Navigation, Support, and Privacy. Looking at "strongly agree" and "agree" on bars, there is somehow no consistency in both the interface's responses as somewhere Amazon has high responses and vice versa.

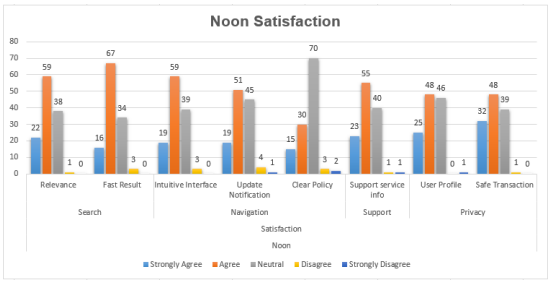

FIGURE 7. Noon satisfaction

But the majority of responses in this Figure 5 show that most people agree on the satisfaction of Amazon, where it can be seen that the satisfaction of Amazon is higher than Noon.

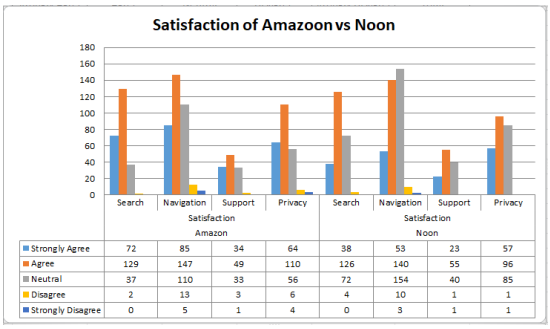

FIGURE 8. Amazon vs. Noon satisfaction

Figure 8 is about the comparison of Amazon and Noon satisfaction using microsoft excel. Figure 8 highlights satisfaction categories, including Search, Navigation, Support, and Privacy. Each subcategory of satisfaction had 2 to 3 questions in the questionnaire. Amazon's satisfaction search category rate in strongly agree is 72, whereas for Noon, it is only 38 and for agree in Amazon is 129, whereas, for Noon, the value is very near to 129, which is 126.

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Then talking about Navigation, so strongly agree is 85 for Amazon, but for Noon it is only 55, and for agrees, it is 147 for Amazon and 140 for Noon. For Support, the number in strongly agree is 34 for Amazon but for Noon is 23, and for agree, Amazon got 49, and Noon got 55. Similarly, the last category is privacy, and Amazon got 64, whereas Noon got 57 strongly agree, and for agree, Amazon got 110, whereas Noon has 96 only. But on average, the strongly agree scale for Amazon satisfaction is 63.75, whereas the average for Noon satisfaction is 42.75. And the average agreement scale for Amazon is 108.75 and for Noon is 104.25. This clearly shows that most of the responses favor Amazon in terms of satisfaction usability criteria.

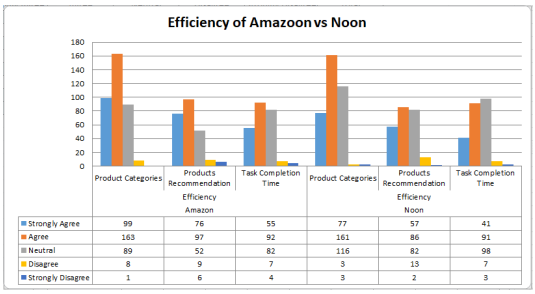

FIGURE 9. Amazon vs. Noon satisfaction

Similarly, Figure 9 is about the comparison of Amazon and Noon satisfaction using Microsoft Excel. Figure 9 demonstrates the efficiency categories, product categories, products recommendation, and task completion time. Each subcategory of efficiency had 2 to 3 questions in the questionnaire. Amazon's efficiency product categories variable rate in strongly agree is 99, whereas, for Noon, it is only 77 and for agree in Amazon is 168, whereas, for Noon, the value is very near to 168, which is 161. Then talking about products recommendation, strongly agree is 76 for Amazon but for Noon, it is only 57, and for agree, it is 97 for Amazon and 86 for Noon. For task completion Time, the number in strongly agree is 55 for Amazon but for Noon is 41 for agree, Amazon got 92, whereas Noon has 91, which is very close to Amazon. But on average, the strongly agreed scale for Amazon efficiency is 76.67, whereas the average for Noon efficiency is 58.33. And the average agrees scale for Amazon is 117.33 and for Noon is 112.67. This clearly shows that most responses favor Amazon regarding efficiency usability criteria.

The descriptive statistics for the two groups that were compared, including the mean and standard deviation, are provided in Table 6. Furthermore, the groups of Amazon-related and Noon-related questions were sorted and separated to conduct the group statistics. And later, to do the group statistics, another variable was created with the name score where the responses to Amazon-related questions with the title Amazon and responses to Noon-related questions with the name Noon were created.

TABLE 6. *t* - test | Group statistics

	Score	
Group	Amazon	Noon
N	120	120
Mean	48.34	31.35
Std. Deviation	16.933	11.945
Std. Error Mean	1.546	1.090

When looking at the Group Statistics table, the first thing to take note of is the mean values. As seen in Figure 4, Amazon's mean is higher than Noon, on average (48.34 as against 31.35), which clearly shows at this point as well that Amazon got more responses for better usability as compared to Noon.

The point to note is that there is a difference between the two means, which is large enough that we can be confident that it is not a result of random error. Now that is the question, and when there is such a situation, the *t*-test comes into play.

It is necessary to use inferential statistics, such as the *t*-test, to evaluate that there may or may not be a statistically significant difference between the means of two groups related to specific characteristics. The *t*-test is one of many statistical tests that can be used to test hypotheses in statistics (Watkins, 2020).

According to the result received, a significant difference is observed between the usability of Amazon and Noon. However, the mean score means the higher the mean score, the higher the expectation, and vice versa, depending on the objective. According to the results (as shown in Table 4), the mean score of Amazon is a little higher than Noon. Therefore, it can be concluded that Amazon has little more significant usability than Noon.

Table 7 demonstrates the independent sample *t* test. Levene's test is an inferential statistic used to determine whether or not the variances of different samples are equal. In some commonly used statistical procedures, the variances of the population numbers from which various samples are selected are assumed to be the same in all cases, regardless of the situation. Levene's test defines the validity of this assumption (Abu-Bader, 2021). The null hypothesis, which signifies that the population variances are equal, is being tested (called homogeneity of variance). If the resulting *p*-value of Levene's test is less than a specific critical value (typically 0.05), the observed disparities in sample

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variances are unlikely to have occurred due to the random sampling technique. Therefore, the null hypothesis of equal variances will be rejected, and the conclusion is drawn that the variances in the population are different from one another.

The analysis of variance and the *t*-test are procedures predicated on the assumption of homogeneous variance (Strunk & Mwavita, 2020). The average mean difference between the two values is calculated by subtracting the mean value of the second group from the first group (Mishra, Singh, Pandey, Mishra, & Pandey, 2019). Here, the Noon means the value will be subtracted from Amazon's mean value (48.34 - 31.35 = 16.99).

TABLE 7. *t* - Test | Group Statistics

		Levene's Test for Equality of Variances		*t*-Test for Equality of Means						
		F	Sig.	*t*	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Score	Equal variances assumed	14.954	0	8.982	238	0	16.992	1.892	13.265	20.718
	Equal variances not assumed			8.982	213.931	0	16.992	1.892	13.263	20.72

In Table 7, the significance level is .000 (that is, a *p*-value of .000), and the *p*-value of Levene's test is written as ".000" (read as $p < 0.001$ – i.e., the *p*-value is small), the test is considered significant (there is a significant relationship) and null value of the Levene's test is rejected. This result tells that the values for "Equal variances not assumed" for the *t*-test must be considered. The correlation between the two variables (Amazon and Noon) is statistically significant because *p* .001 is less than one (Mishra et al., 2019). Since the *p*-value is less than the significance level (e.g., 0.05), the null hypothesis can be rejected. There is a statistically significant difference between the two mean values. The 95% of the confidence interval of the difference is [13.263, 20.720], which does not have a 0 value, which highlights the small *p*-value of the significance test. The sample provides compelling evidence that the two population means are unequal, leading to the conclusion that they are not. In this study, the Null Hypothesis was that:

H1 - Noon is more Efficient in terms of Usability than Amazon.

H2 - Noon is more Satisfactory in terms of Usability than Amazon.

But the responses and the independent sample *t*-test interpret that Amazon is better than Noon in terms of Usability criteria, efficiency, and satisfaction. As a result of the statistical analysis, we reject the null hypothesis and accept the alternative hypothesis because the significance level is less than the cut-off value (e.g., either 0.05 or 0.01).

DISCUSSION

The key observation from the findings can demonstrate that Amazon's interface is better than Noon's since most people favor Amazon's interface usability in terms of satisfaction and efficiency. The questionnaire was shared with the end users via Whatsapp. But the researcher wanted to try something creative, so the form link was then converted to a QR code, and the students present on campus were given the QR code to fill out the form because it was difficult to provide each one of them with the link or share with them using any platform. The idea of QR codes was good because some were printed, and some were in the researchers' mobile phones so people could scan from there instead of wasting paper to get QR printed on them. At the time of sharing the survey questionnaire with the end users, they were first shown both Amazon and Noon Interfaces so that they are well aware of the interfaces. They were also asked if they had already used these websites or if they wanted a proper time to experiment and explore the interfaces of both platforms; the majority were already aware of both interfaces. But it was not easy to gather information from many participants. Earlier, the researcher could gather only 87 responses from the end users, so the researcher again requested people to take some time and fill out the survey while reading the questions carefully. And later on, the researcher was able to gather 120 responses. The respondents were aware that the privacy of their data and information was being taken care of because their email and names were not asked in the form, and because of that, people agreed to fill out the form.

STATEMENT OF LIMITATIONS

The limitation of this paper is that the responses could have been more, and instead of just taking a survey from the end users, there should be some heuristic experts involved in the research so that their responses can also be considered. Apart from that, ecommerce websites' usability was mea-

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sured primarily per the microsoft usability guidelines and SUS criteria, and concentrated solely on satisfaction and efficiency. Many more aspects influence the usability of e-commerce interfaces than those discussed in this research, and it is hoped that more factors will be explored in future studies. Furthermore, statistical Tools apart from SPSS can be used in further research. The weakness in the paper is that the researcher had less time and knowledge to complete the paper, and if given some more time with formal learning and a background in statistical analysis and research writing, the paper could have been way better and strong in terms of statistical analysis and literature review.

CONCLUSION

This study was intended to compare two interfaces; Amazon and Noon usability, based on two Usability criteria; satisfaction and efficiency, through a usability test. These criteria were further divided into subcategories. Overall, the results obtained from data analysis proved that there is a usability difference between Amazon and Noon interface. Based on the responses of 120 participants from the online questionnaire and the statistical analysis using an independent sample *t*-test with 95% confidence in SPSS, it can be said that Amazon has a better Interface in terms of usability, satisfaction, and efficiency. To elaborate more, the *t*-test Group statistics highlight that the mean value of Amazon is 48.34, whereas the mean value of Noon is 31.35. Both interfaces provide adequate satisfaction and efficiency to the users since the result was very close. Based on the independent sample *t*-test, it can be stated that:

There was a significant difference between the mean score of Amazon and Noon (t 213.931 = 8.982, $p < 0.001$), reference Tables 6 and 7.

The average mean difference between Amazon and Noon is 16.99.

RECOMMENDATIONS

To provide efficient and satisfactory user interface, it is important to know the user's requirements and needs. There should be satisfaction at the customers' end when using the interfaces. Also, satisfaction and an efficiency of an interface should be considered from the end users' perspective. Some easy-to-access tabs can be created to help users easily redirect to the desired page or an interface that would let users get their desired product more satisfactorily and efficiently.

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