Mobile Phone Usability and its Influence on Brand Loyalty and Re-Purchase Intention: An Empirical Study

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Abstract— Mobile phones today have become an integral part of every person's life. With the advent of smartphones, in addition to voice and text communication, people today can browse the internet, log in to social media, purchase merchandises through e-commerce websites and make monetary transactions using mobile phones. Hence usability of the phone plays an essential role in making a purchase decision. This study aims to capture the experience of mobile phone users by measuring their perceptions about attributes of usability and its impact on brand loyalty and re-purchase intention. Data was collected from 301 mobile phone users from the millennial generation and analysed using structural equation modelling. Results indicate that only 'satisfaction' derived by using the mobile phone develops brand loyalty, which in turn influences the re-purchase decision. Implications are drawn, and recommendations are made to increase the usability of mobile phones.

Keywords— Usability, Satisfaction, Brand Loyalty, Re-Purchase Intention, Mobile Phone, India, Efficiency, Effectiveness, Human-Computer Interaction

I. INTRODUCTION

Smartphones have transformed our way of life. With the advent of 4G data, not only can we access almost any type of content on mobile, but it has also opened avenues for other markets and businesses using mobile apps [1]. Mobile phones have found its use in banking, food industry, medical sciences, and in classrooms. For efficient completion of the above tasks using mobile phones, a variety of 'applications' are available in play store and app store. These applications provide excellent value to the customers to do their essential transactions in terms of the ability to transact beyond regular office hours and surpasses limitations of distance and geography. Today, we are dependent on smartphones in two forms: functional and existential dependence [2].

Further government services today are being offered on mobile platforms where people can apply, check, and pay for government documents using their mobile phones, popularly known as m-governance. In India, although m-governance is still in its introductory stage and not so popular among masses, mobile payments using BHIM (Bharath Interface for Money) application has been gaining steady popularity (National Payments Corporation of India). Thus, with the increase in the scope of mobile phones, their demand has seen a considerable impetus. In India, there are 997 million mobile phone subscribers and 239 million smartphone users. The Indian smartphone industry grew by 20 percent in the second quarter of 2018. Further, the smartphone industry in India is expected to grow by double digits for the next two years, and India is expected to be a preferred market for global smartphone players. Hence "usability' of mobile phones plays a vital role in making users experience with mobile phones more fruitful to make them loyal to a previously experienced brand and make a second purchase of the same [3].

Usability studies are rooted in the 1970s in the work of "Software Psychology". The term Usability finds its roots in the field of Human-Computer Interaction (HCI), where it was introduced to conceptualise the ease of use of the visual display in computers. According to the ISO 9241-11 standard usability is "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use". This study in the first stage of investigation explores the impact of usability of a mobile phone on brand loyalty and in the second stage of the investigation, studies the influence of brand loyalty on re-purchase intention.

The motivation behind this study is to answer the following research questions:

RQ1: What is the impact of mobile phone usability on brand loyalty among millennial users in India?

RQ2: Does brand loyalty influence the users' re-purchase intention of the mobile phone? Based on research questions, a literature review on the usability studies was carried out.

II. LITERATURE REVIEW

Mobile phones have become indispensable in recent years. The technological growth has enabled the development of many applications that help people to do many tasks when they are on the move. The usability of a mobile phone is measured based on attributes like effectiveness, efficiency, and satisfaction. Further studies proposed some modifications to the existing usability frameworks. They suggested that "Product" be replaced with "Technology" as this term gives the user a notion that they are interacting with many components and not just the application or product itself. Some studies hold a position that absolute evaluation of usability is not possible. However, several evaluations based on several perspectives can indicate it. FITT (Fit between Individuals, Task, and Technology) Model-based usability studies are quite common. The FITT model proposes three dimensions on which the adoption of technology is dependant: 1) the task-technology fit, 2) the individual-task fit, and 3) the

individual – technology fit. The design of both effective software and hardware is critical. Users prefer voice and physical Qwerty inputs over handwriting, onscreen keyboards, and tracing input methods, irrespective of age group [4]. Osman studied the effect of animations on usability and found that there must be a balance, as too many animations affect the performance of the application. They should be used after considering the context of use and age group of the target audience. Studies also suggest that there is a correlation between user knowledge and icon. Mobile phones have impacted many lives, especially those of students. A study conducted in Greece observes that students consider mobile phones as a lifestyle gadget than a necessity. However, there exists heterogeneity in the affinity towards smartphones. Ahmed, in his study, recommended that it is imperative to work on a design interface that will help older people to overcome usability problems. Studies suggest that a correct distribution must exist between usability, pedagogy, and technology in a learning system. Usability is being tested in several fields with different applications; Mobile Commerce Application, Software Solutions, Multimedia Content, Web Content, Education, and Learning. Based on the comprehensive literature review, the following conceptual model was framed:

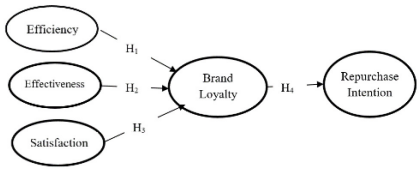

Fig. 1. Conceptual Model

A. Definition of the constructs and the hypothesis

Usability is defined as the "Extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" by The International Organization for Standardization (ISO). The ISO standard outlines three measurable attributes: Effectiveness, Efficiency, and satisfaction to measure the usability of a system. The ability of the user to complete their task with accuracy and speed is Efficiency. This attribute reflects the productivity of a user while using the application. Efficiency can also be defined as the way that the mobile phone supports the user in order to conduct the task [5]. The response time of the application or system is an essential factor to be considered. Efficiency also refers to the number of resources a user consumes to reach a task goal. Speed is one of the primary aspect users look for on a mobile phone. The consistent use of mobile phones can lead to the phone hanging often and other issues, which can lead to the dissatisfaction of a customer. A well-defined and intuitive user interface helps the user navigate better and perform the functions they require accurately. Good menu design is also found to be helpful. Hence, we can say a mobile phone with accurate information and consistency can attract customers in a better way [6], and we can hypothesize that:

H_1: Efficiency of mobile phones has a significant influence on brand loyalty.

The ability of a user to complete a task in a specified context is termed as Effectiveness. It is the extent to which a user's task goal behaviour, or the percentage of tasks solved [7]. As effectiveness is a combination of other goals, it can be challenging to identify quantifiable criteria. One method to measure effectiveness is to compare the user's performance with the required levels. Error rates and quality of the solution, i.e., a measure of the outcome of the interaction of the user with the device, are indicators of effectiveness as well. In recent times, mobile phones have replaced laptops and computers. The five categories of user information based on human characteristics are Demographic/Social information, Knowledge/Experience characteristics, Emotional /Psychological characteristics, Perceptual/Cognitive characteristics, and Physical/ psychomotor. These help in defining the characteristics of a target user systematically, mainly when users with special needs are targeted. Mobile phones must be able to incorporate these and provide an informational experience to the user. The increasing supply of web-capable devices along with decreasing prices for data connections is likely to further increase the demand for a new generation of mobile-friendly websites. Users turn to their mobile phones the minute they need any information. Hence, we can hypothesise that:

H_2: Effectiveness of Mobile phones has a significant influence on brand loyalty.

Satisfaction is the perceived level of comfort and pleasantness afforded to the user through the use of the software. The attitudes and responses of the user towards the software are indicators of satisfaction. Satisfaction varies between individual users and is often measured subjectively. With the 3G/4G/Wi-Fi technologies available today, online shopping is a part of the numerous applications available. Some of them include gaming, browsing, texting, calling, etc. If a phone is used for extensive gaming, a bigger screen and good sound quality is required. Customers rely entirely on mobile phones for communication purposes. Phones with better communication technologies can lead to a higher number of satisfied customers; this forms our third hypothesis [8].

H_3: Satisfaction in the use of Mobile phones has a significant influence on brand loyalty.

Brand loyalty is one constituent of the overall brand equity, which is the extent of the brand's power determined by consumers' experiences with, perceptions, and positive or negative knowledge of the brand. It is a commitment to repeat the buying of a product or service in the future, irrespective of marketing efforts by competitors or situational influences [9]. Jackson hypothesises usability as a driver of Brand Loyalty. Surveys are considered to be the best way to measure brand loyalty. Brand loyalty can be categorized as cognitive, affective, and conative [10]. In 2001, Chaudhuri studied two aspects of brand loyalty, purchase loyalty, and attitudinal loyalty. Simplicity and interactivity are often overlooked attributes influencing brand loyalty positively [11].

There are many different types of mobile phones available in the market. Customers are often confused while choosing between different brands. The popularity and image of a brand can influence the consumer's decision. Even with higher prices and fewer features, customers are intended to buy phones of a well-known brand. This type of brand loyalty has

come through all the user-friendly features provided by the companies. Usability is found to be a distal determinant of brand loyalty through the indirect influence of satisfaction and brand trust. The usability-satisfaction-trust-loyalty linkage is the central brand loyalty-building mechanism. This leads us to our final hypothesis:

H_4: Brand loyalty has a significant influence on Purchase intention in mobile phone purchases.

Purchase Intention is the scale that measures the likelihood that a consumer will buy a product he/she is knowledgeable theorised. Laroche tests two types of effects on purchase intention using data on consumers' attitudes toward beer brands in a choice set: a direct effect and a competitive effect. The direct effect indicates only the attitude toward that brand determines that intention to buy a brand. The competitive effect implies that attitudes toward other competing brands may affect intention toward a focal brand. One of the determinants of purchase intention is confidence in brand evaluation. Purchase intention is a standard effectiveness measure and often used to anticipate a response behaviour. An increase in presence would result in higher product knowledge, brand attitude, and purchase intent.

III. Methodology

The research design consisted of two steps. First, identification of the constructs through a structured literature survey followed by an expert panel constituted in order to arrive at suitable measures for the study. As the study constructs efficiency, effectiveness, brand loyalty, and re-purchase intention are well defined and measurable in the literature, standard questionnaires from previous studies have been adopted for the purpose [12]. The data required for this research was collected using a structured online survey. The target participants of the study were people who are familiar with smartphones and their usage. Since the target respondents are users' mobile phones, probability sampling was considered more appropriate. Hence, a simple random sampling was adopted to collect the responses. The data was processed using the tool SmartPLS, and the statistical technique structural equation modelling (SEM) used was to test the hypothesis. Initially, we conducted a pilot study with 30 responses, where we ascertained the reliability and validity of the questionnaire. The data was categorised using Structural Equation Modelling using Smart PLS software.

Once the pilot study results ascertained the suitability of the survey instrument, we collected data from a broader range of respondents, which was determined as per the sample size calculation. The total responses required according to the sample size calculation was 384. Email and physical distribution of the questionnaire was the primary tool used to collect data for this study, along with a survey website and other modern communication media. Because of the email response method, each respondent was limited with a single chance to fill out the survey. This study used a five-point scale for respondents' opinions, ranging from 1 (strongly disagree) to 5 (strongly agree). A total of 301 responses were received and analyzed. Hence, we proceeded with the execution and analysis of results. The Respondent Demography is as shown in the table:

TABLE I. Respondent Demography

		Percent
Gender	Male	63.1
	Female	36.9
Age	Less than 25	74.1
	26-35	9.3
	36-45	6.9
	46-55	6
	More than 55	3.7

After determining the model validity and reliability, the structural model analysis was conducted to test the hypotheses. A bootstrap test was conducted to test the hypothesis and relevance between two factors. R 2 (coefficient of determination) is used to evaluate the model's predictive accuracy, i.e., the variation in the independent variables explains the proportion of variance in the dependent variable. In order to measure reliability, consistency of the measurement scale and variability of the constructs, Cronbach's alpha (α), composite reliability (CR), and average variance extracted (AVE) are used respectively. The Cronbach's alpha (α) and CR values should be greater than 0.7. In order to attain the variability in the constructs, AVE should be greater than 0.5 [13]. To assess on how much the variables in the model differ from each other discriminant validity is required. The square root of AVE for all the latent variables was higher than the value of correlation analysis; this confirmed the discriminant validity, [14].

IV. Results

In this research, it is found that customers care about efficiency, effectiveness, and satisfaction. With loadings of 0.607, 0.921, and 5.737, respectively, they are good indicators of brand loyalty. The usability of mobile phones should not overlook these essential elements of day-to-day operations, which have been shown to significantly influence customers' satisfaction level, their intention to buy the same mobile phone, and whether or not they would recommend this phone to others.

A. Hypotheses Testing Results

Since the p-value of hypothesis 1 and 2 are more than 0.05, they are not supported. On the other hand, H3 and H4 values are less than 0.05. We can say that satisfaction plays a significant role in brand loyalty, and in the same way, brand loyalty is responsible for re-purchase intention.

TABLE II. Hypotheses Test Results

	Estimate	**Sample Mean**	**Standard Deviation**	**t-Statistics**	**P Value**	**Remarks**
H_1	0.078	0.089	0.084	0.921	0.357	Not supported
H_2	0.052	0.051	0.086	0.607	0.544	Not supported
H_3	0.517	0.512	0.090	5.737	0.000	Supported
H_4	0.784	0.785	0.028	28.431	0.000	Supported

V. Conclusion

This study aimed to develop a working model for determining the usability of mobile phones. The results highlight the importance of efficiency, effectiveness, and satisfaction as essential factors in mobile phone usability. The study did not support efficiency and effectiveness as significant factors to influence brand loyalty. However, satisfaction emerged as the most significant factor which leads to brand loyalty. One reason for this could be that the user group has assumed efficiency and effectiveness as the inherent qualities of mobile phones. This study also supported the fact that a loyal customer is likely to buy the product, which reinforces the importance of customer satisfaction and brand loyalty. The study further helps in understanding the usability of mobile phones and what are the requirements of each individual that lead them to make a buying decision of a mobile phone.

Mobile phone companies have been targeting customers on various features of the phone. This study suggests ease of using the phone, speed, and the comfort with which the phone can be used as necessary attributes that lead to brand loyalty and repurchase intention. Mobile phones have concentrated much on technicalities and features but not so much on emphasizing the brand. This study emphasizes the importance of satisfaction of use on brand loyalty, thus resulting in purchase intention. Marketers should thus stress the brand in their promotions along with efficiency and effectiveness of use. They should focus more on features like speed, accuracy, and communication. Customer satisfaction can increase by improving these features, which will create a massive impact on brand loyalty and purchase intention.

VI. Limitations and Future Scope

Usability has many dimensions. This paper has taken into consideration effectiveness, efficiency, satisfaction, which are dimensions as per ISO 9241(1992/2001). Nielsen had proposed attributes such as Learnability, Memorability, and errors to the actual three dimensions. PACMAD (People at the center of mobile application development) model added cognitive load and had user, context, and task as three factors that affect usability. The model used in this study has followed the attributes suggested by ISO only. Usability attributes keep evolving with the change in technology, and studies on attributes such as accessibility, operability, acceptability, and flexibility may throw more light on the use of devices. This study is empirical. An experimental study with the use of smartphones will add value in terms of actual usability. A comparison of different brands of smartphones based on usability is being considered as a further research option. This study has taken into consideration millennial users. A comparison between age groups and gender on usability will help phone manufacturers to add features to cater to a particular target segment.

VII. References

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