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A Comparative Study On Uid/Ux Of Mobile Applications

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ABSTRACT

The research aimed to study the user interface design of a mobile banking application's of Tamil Nadu. Also, this research works tries to improve the user interface by analyzing its design aspects. A private bank's mobile banking application is analyzed and taken in this case study. The design aspects, user experience, security system, loading time, cognitive load, easiness, and its content pages are analyzed in order to give suggestions to improve the usability of the system. A qualitative content analysis method is used in this study. The Equitas small finance bank's bank mobile application is taken for this case study. This research tends to conclude that the Equitas mobile banking application has many advantages in simplifying the financial transaction process. Also, it has smart features such as face and fingerprint detection technology for the smart phone user groups.

It is a customer centered design and it has many advantages in flexible communications. This mobile banking application can be improved in terms of its speed, auto-fill options, EMI options, and security features. Also, it should be improved to pay bills to electricity board, state government, and central government organizations. Aadhar card and photo features are not included in this application. The design of the application needs improvements such as the order of preferences in pages and links. The check's transaction details and the loan's details are not included in the mobile banking application. Furthermore, the frequent transaction details are not updated according to the customer's expectations. The updating details and improvements need to be informed well in advance.

Typeof Paper: Case Study

Keywords:UX design, UID, loading time, cognitive load, Customer centric design, improvements.

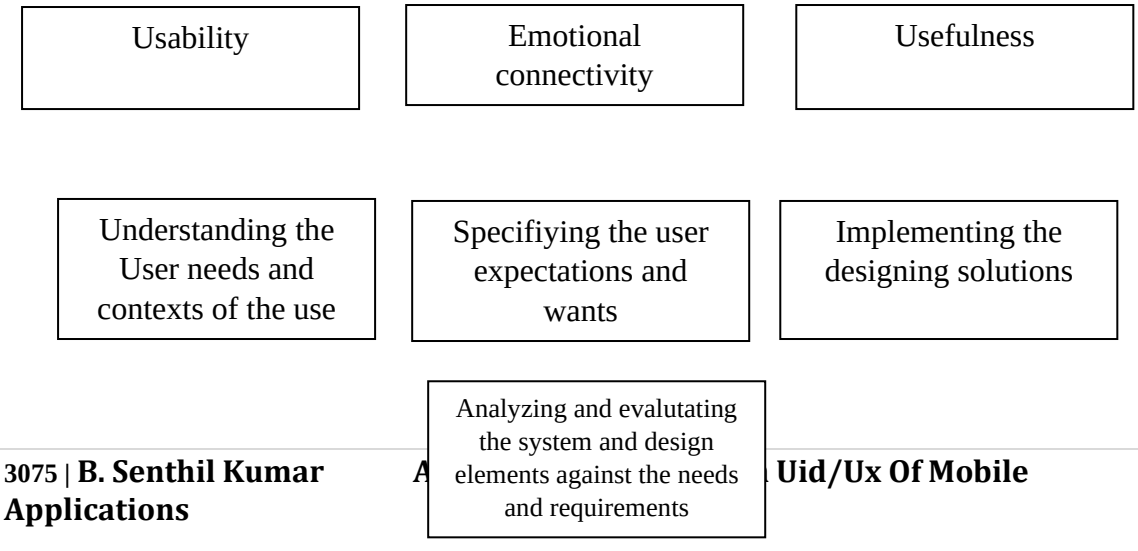
1. Introduction

User interface design and usability are the integral parts of user experience design. UX design covers all the areas such as design, process, function, branding, and usability. According to Don Norman (Inventor of the term UX), the term includes all the aspects such as initial process to the final stage of the product or service. It includes services, helps and maintenance of the product or service. The UX designers have not only developed products or service that are usable, but they will focus on user experience, efficiency, fun factors, and functionality. A good user experience will be created based on the user's needs and wants. A user experience of a product or service has three important aspects. The good UX designer should concentrate on three aspects like why, what, and how of product use. User centered design is a process of developing products based on the user's expectations, needs and wants. The end user and their context is considered as the very important aspect in user centered design.

According to Don Norman human-centered design is not a process. But it is about the consideration of human-centered design based on HCD principles. The HCD designers should focus on people and the entire system to solve the problem. Don Norman has given importance to the task and functions rather than the design of the application. India has the second largest telecom market in the world. Furthermore, India has more opportunity in mobile banking sectors. Millions of people need the mobile banking applications for their day to day banking transactions. The researcher Deva Devan has identified the mindset and issues related to security in the mobile banking system in India [6].

User centered design:

A user centered design should have the three important components. They are useful, Usability, and emotional connectivity. This framework can be graphically represented as **UCD framework**:



A user centered design should have the following important design considerations. They are

Cognitive load:

Cognitive load refers to the mental capability and mental strain of the user. Also, it refers to the totality of the brain's memory to handle the information. In other words, it refers to the information processing capability. More information in a system needs more cognitive ability to store, retrieve, and process. Minimizing the cognitive load is a method to enhance the usability of the system. A good user interface design requires a minimum cognitive load and maximum flexibility and better user experience. A Human computer interaction system should have a minimum level of cognitive load and it should have a good design to handle the memory of the human memory.

Cognitive load questionnaire:

The cognitive load of the users is gathered using the standardized cognitive load questionnaire. The cognitive load questionnaire helps to identify the difficulty of the memory and usability of the given system. Also, it helps to test the system's functionality in a given task. Cognitive theory is an evolutionary theory. This theory is proposed in 1980s and developed tin 1990s. It assumes the presence two divisions in the knowledge process. They are acquired through the primary biological knowledge (innate) and secondary knowledge. The primary biological knowledge is based on the innate knowledge of the human brain. The secondary knowledge is based on the information gathered by the human brain by instructions, observations, and experiences. [Sweller, 2011]. Furthermore, the secondary knowledge needs more memory storage in order to understand the information in a proper way. The human brain needs more memory and storage capability to understand the complex problems and novel information. This theory gives more inputs regarding the cognitive aspects related human computer interactions. The development of mobile applications, digital business solutions, and social media sites develops the importance of minimizing cognitive load with maximum usability and flexibility.

Developing User centered design system:

There are five stages and five principles are present in the design of the user centered design of a mobile application system. They are

1. Understanding the users' needs, wants, and goals.
2. Easiness, flexible, and enjoyable.

3. Consistency in the design and information process
4. Interactive contents
5. Solutions to the user problems and simple

A good human centered design should consider all the human constraints and problems. It should understand the human and emotional boundaries.

Objectives of the study:

1. To analyze the content of the mobile banking application of a private bank
2. To study the application of UX principles in the m-banking application
3. Suggest the improvements needed to enhance the UX

2. Literature Review

According to the report published by Alex the information technology companies like Google, Apple, Facebook, and Amazon, social media have entered into the m-banking sector [1]. In order to cater the needs and competitiveness in the mobile banking and financial sectors, other traditional banking companies needs to adapt the new and innovative m-banking applications and new strategies for online banking (Alex, 2020) [2]. The rapid development of mobile phone technology leads to the development of mobile banking technology [3]. This digital revolution gives more opportunity to design a flexible and enhanced user experience in the banking sector. The researchers Diana and Diaz have conducted research on usability tests on two types of mobile banking prototypes named prototype A and prototype B. They used Nielson's heuristic method of the prototype [4]. They found out the effectiveness of Nielson's heuristic method in user centered design. (Diana, Diaz, 2018).

Sharma, Prerna, Bamoriya&Preeti Singh (2011) studied and identified the issues in a mobile banking system in India [5]. They identified the issues such as security, compatibility, privacy, standardizing, and software services. (Sharma, Prerna, 2011) [7]. According to their research mobile banking services can be classified into SMS banking, browser based model, software based model, and mobile applications. Chia's research shows the importance of changing the current banking system. Aresearch on the topic 'design thinking and banking sector' shows the threats in banking business sectors. It has shown the development of Fintechs-new business technology applications such as Pay Pal, Apple Pay, Android Pay, and M-Pesa. This research works shows the importance of m-banking system's development. The DBS bank system has implemented the home connect application for the bank customers in order to home loans, rental information, and mortgage payment calculations. OCBC bank has developed the five step design thinking process in order to develop their business. They use the customers engagement

procedures and stakeholder engagement plans to understand the needs of the customers. Also, they use the family and kid policy to facilitate the customers' relation. Furthermore, they use the prototype testing tools, and focus group discussions modes to enhance the flexibility and usability of the system.

Germany's Deutsche bank used the design thinking experts' views on their banking system. They used the suggestions in their information and communication department. Then they implemented the projects. They used the three step design process. They were learning, adapting and diffusing the concepts. It worked well. First, it was implemented by the IT department and then expanded to other departments in the banking organizations (Vetterli, 2019). Within eighteen months their customer centric business projects got success. After that they developed a separate design thinking department in their banking organization.

MindaGilces conducted experimental research on the development of new prototypes. They developed and tested two prototypes of mobile banking application. They named it prototype A and prototype B. Also, they used empirical data and Nielsons heuristic model to design the user interface. They found out the use of heuristic model in the design process. It performed better than the prototype A (MindaGilces, 2018).

3. Research Methodology

The content analysis method is used in this research to study the user interface design of the mobile banking application. The secondary data is collected from the review of related research papers. The variables such as design aspects, links, information, priority tabs, services, loading time, cognitive load are taken to analyze the content of the mobile banking application.

Equitas Small Financial Bank mobile application

Design elements	M-banking application
Colors of the application design	Mostly blue and white background
Infographics	Female face is used to show the service mode present in the m-banking application
Icons	Not enough icons to show the hierarchy of directions
Symbols	Rupee's symbol is used

Service hierarchy	Transfer to another account is placed below the transfer to own account link
Indian traditional graphics and system	It is not used. (Only the basic design is used)
Adapted to Screen	There is no adaptability to various screen modes (Example: Rotate and expand mode)
Emphasis	There is no emphasis of important links
Variety in design	There is no variety to show the contrast
Balance	Design elements should be balanced in the system.

Table: 1

Table 1 shows the design elements such as color, icon, symbol, balance, variety, emphasis, and traditional design

Information and cognitive load

Information	Cognitive load	Possibility
Money transfer	Need to reduce the steps to transfer the money to other accounts	Money transfer is the very important option so it can be facilitated
Government	There is no link to find out the payment option	Government and other private registered company details can be added for easy transactions
Email and PDF	Email and pdf files of the transactions	It is possible to send the transaction details to the registered email id

	should be sent to the registered email id.	
EMI and loan	EMI and loan details should be included in the application	EMI and loan details are very important to customers so it should be added
Money convertors	Converting the money from Indian currency to USD and other standard dollars needs more process	Universal money converter options can be included in the mobile application in order to faster the money transaction steps
Health information	The mobile banking application should include the health related information such as insurance and other schemes	Insurance and other schemes should be included in the mobile banking application in order to give awareness among the customers.

Table: 2

Table 2 shows the information, Cognitive load, and possible ways to extend the services of the mobile banking application.

The Equitas mobile application's screen shots as of January 2020. First page of the M-banking application.

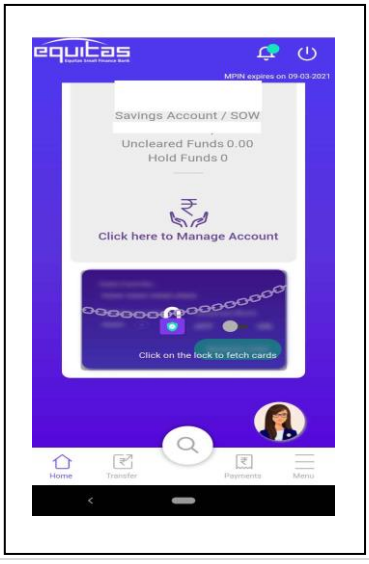


Figure 1

Figure 1 shows the front page of the Equitas mobile banking application

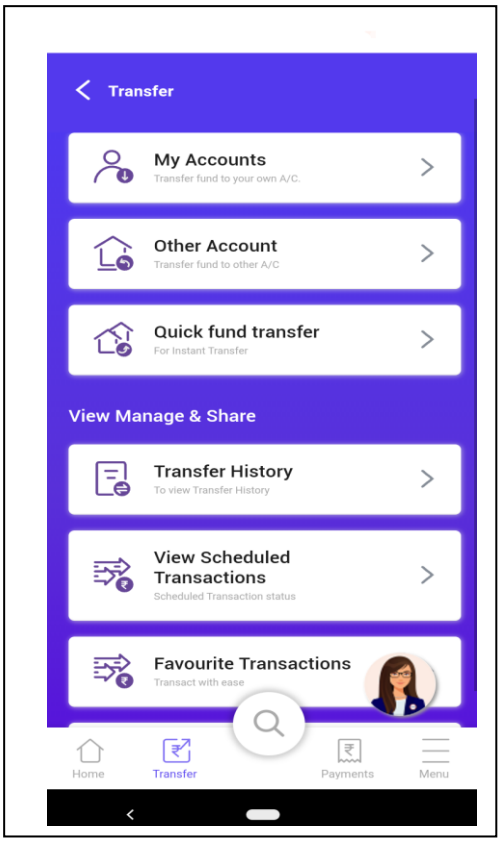


Figure 2

Figure 2 shows the second page of the Equitas mobile banking application DBS banks' mobile application front page

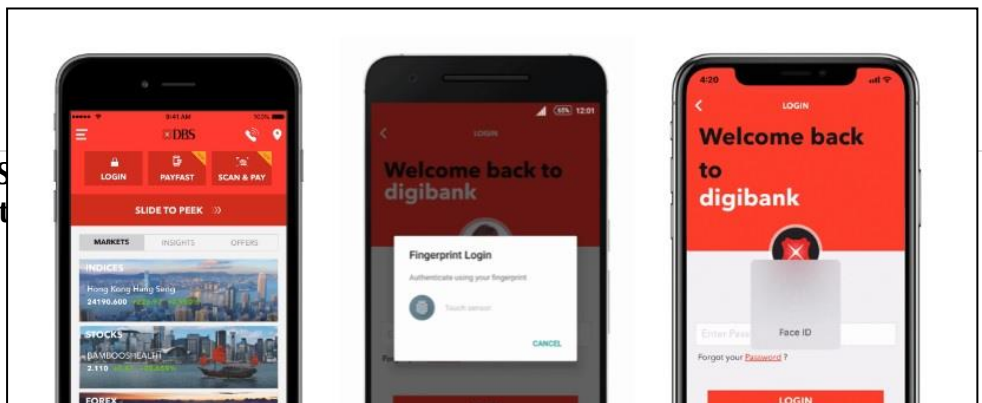


Figure 3

Figure 3 shows the DBS bank's mobile banking application. It includes the face deduction option on the front page.

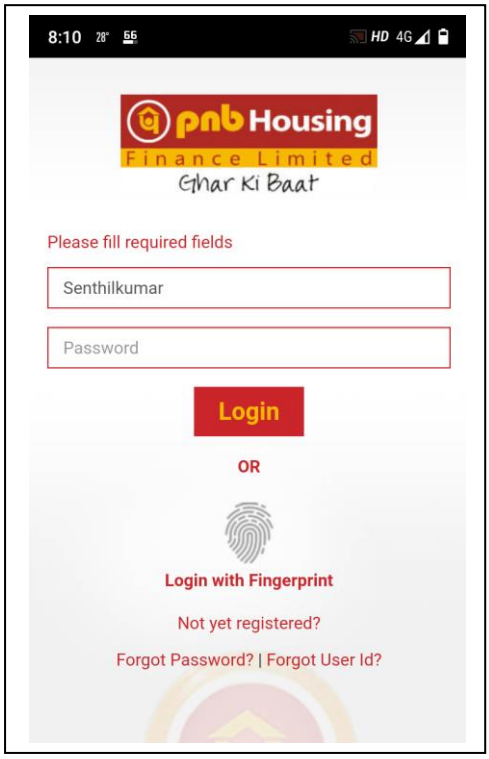


Figure 4

Figure 4 shows the Punjab National Bank's mobile application.

4. Conclusion

Due to the rapid digitization the mobile banking needs more flexibility and security in order to satisfy the customers from various sectors. The next generation z customers need more enhanced designs and well-defined contents. The digital transaction is growing in a very fast pace. The content of the mobile application should be designed with the user's suggestions and improvements based on the various levels of the user groups. The details such as loan availed by the customer, EMI payment details of the customer, monthly due dates of loan available by the customer, and payment related messages should be included in the mobile banking application. The connection between the Tamil Nadu government and private sector services should be included in the mobile banking application. The Aadhar card details and pan card details should be included in the mobile banking application. The lack of regular updating and the lack of servicing during the working hours should be avoided in order to maximize the customer's usage. In this research paper, it is observed that the current mobile banking application needs many enhancements related to its visibility, usability, and flexibility. The options such as generating loan details and generating EMI data will immensely help the customer to know their status through the mobile application. Many banking companies are deducting money from the customer's account without any prior notice or short message services. The deducted amount's details are not consolidated and updated in the mobile banking application. The reason of the deductions should be clearly mentioned in order to inform the customers. The mobile application does not have the options to stop some unwanted services from the banking company. For example, if the customer does not need the insurance facility, it should be stopped by the mobile banking application. The loan eligibility details, and new services by the banking company should be mentioned via the mobile banking application. This research shows the differences in the user-interface design of different banks. It shows the need for advancement in design and solution in the mobile application. Furthermore, it shows the need for flexibility and usability of the m-banking application.

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