

# Designing Banking Kiosk Interface

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**Abstract:** The aim of this study is to design a banking Kiosk. Banking Kiosk is one of new technologies for making banking procedures quick and easy. Since the banking kiosk has not been used largely in Iran, it was tried to design both body and software interface of a banking Kiosk suitable for use in Iran. For this aim the users were identified and their behavior was studied. Due to the gathered data with the help of object oriented design method and UML diagrams, the kiosk software was designed. A prototype was developed and a demo of the designed software was added to it. The prototype was evaluated in comparison with an ATM. Sixty six people were studied in two groups. The result of the evaluation showed that the newly designed banking kiosk improved in comparison with ATM as a current device.

**Keywords:** *Interaction design, Interface Design, Object Oriented design, Banking Kiosk, Emotion*

## 1. Introduction

The World almost in everywhere faces the transportation problems. No one likes to stay in traffic jam and waste his valuable time. In order to solve big problems such as traffic, there is a need to see the roots of problem. One of the factors that has an important role in making traffic problem is trips to Banks. In countries such as Iran still most of banking happens in the banks and most of routine deals are in cash. Obviously, this traditional way of banking causes more daily urban travels. If routine deals take place through modern banking systems, number of referrals to the banks for banking such as withdrawing money will be unnecessary. The best solution for this problem is diffusing e-banking. Although in Iran internet banking is used, but it is not in vogue. Products such as banking kiosk can cause more use of electronic devices and maturing e-banking and even internet banking. In banking Kiosks the software and software interface are more important than the hardware. In fact, the software assigns the functions and abilities of a kiosk. Hardware is just consists of tools for what the software needs, and defines software and interface boundaries. In the design process both the body of the hardware and a demo for the software interface were designed. However this paper is focused on the interaction and software interface design. In order to set a new communication through design, identifying the users and their specifications is necessary. Therefore, the first step is identifying the user.

## 2. Identifying the user

For establishing an interaction there is a need to know how users think and perform. There are seven stages for an action that usually users follow them: one stage is for goal, three stages for execution and three for evaluation (Figure.1) [2].

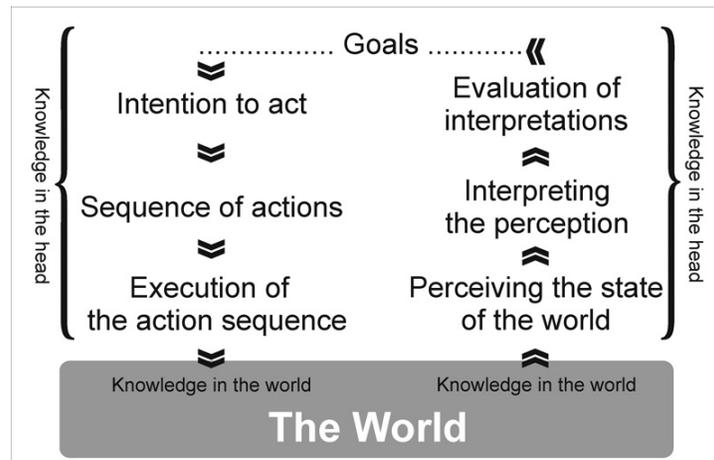


Figure.1 [2] Seven stage of action

Man uses knowledge of his head and knowledge of the world, but the information that is coded in one's brain just needs great amount of accuracy to fulfill the quality of desired behavior.[6] However, if users have problem to interact with a device, it is due to perceiving the interface elements or the overall appearance. In other word the main problem is regarding "WYSIWYG" (What You See Is What You Get). In fact, in case of facing with problems, users do not see anything to understand or there is not any sign to guide them [5].

Whatever people do, are based on two kinds of knowledge: Knowledge regarding 'of' called declarative knowledge, which contains knowledge of facts and rules. Knowledge regarding 'how' called procedural knowledge, which obtained through experience and is more subconscious. The second one is hard to learn. Therefore, it is not a good way to establish a temporary interaction based on this knowledge. It is very good for professions or routine tasks that do not need special attention to how we do them, like: driving, walking, professional sport, etc. [2].

Based on Donald Norman's Emotional Design, human beings perceive or response to environmental stimulant via three levels: Reflective, Behavioral and Visceral.

"It is only at the reflective level that consciousness and highest levels of feeling, emotion and cognition reside. It is only here that the full impact of both thought and emotions are experienced. At the lower visceral and behavioral levels, there is only affect, but without interpretation or consciousness. Interpretation, understanding and reasoning come from the reflective level" [3].

### 3. Designing Interface

In today world, almost all devices need software. Need to software in multimedia products is changed to a key and essential element of these products. Products such as mobile phones, Mp3 players, game consul permeate increasingly in human's life. Therefore, designers of these equipments should pay special attention to their software part, since the most efficient part of these products is concealed in GUI(Graphical User Interface). Although this doesn't mean that hardware is no longer considered in such equipments. Obviously the apperence of the device is very important too.

While banking kiosk is more similar to ATM (Automated Teller Machine), thus it has been tried to consider the same functions of ATM, except money dispensing in this device. In order to find information regarding this device, similar samples of existent software (ATM's software) have been studied. Essential knowledge about the banking system and technical limitations was obtained through interviews and observations.

Then, details and relations of components have been specified through the process of object-oriented design. One of the most important advantages of object-oriented design method is the regular classification and identification of all factors and components of a system, which could be software, firm and product. Therefore, each component should be specified as a defined object and part of a class. This arrangement and classification along the possibility of various characteristic's attribution of classes, which is generalized to all objects in classes, has prepared the possibility of complex and large systems' control and designing [1].

Object-oriented design creates instruments for practical applications. For example, Unified Modeling Language (UML) that is able to model a complex system and suitable visual representation of such modeling by different diagrams. Among the important applications of this modeling language, modeling of activity process, modeling of communication between components and modeling of defined objects in a system can be pointed out [4].

Figure.2 represents a sequence diagram of transfer function.

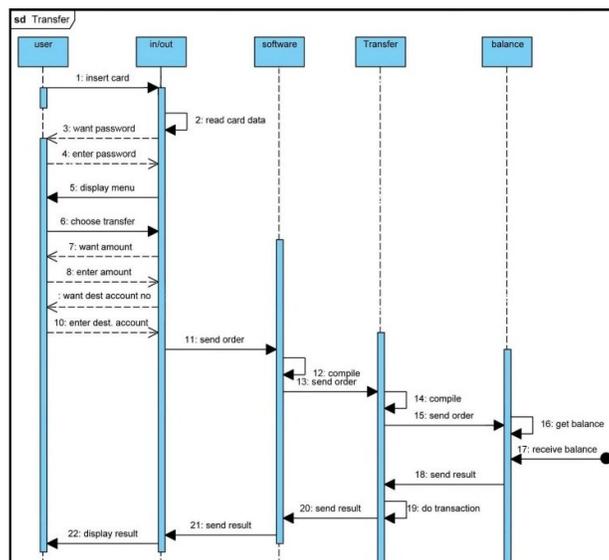


Figure.2 (“Transfer” sequence diagram)

Based on studied, interviews and UML diagram outcomes, interface parts, tasks and functions of the device were defined. Then activity and interaction scenario was written and story-boards were drawn. Based on these studies it was the main tasks of the device were determined which are: Transfer, Bill Payment, Balance, Invoice, Change password and Purchase. These tasks are shown in Figure. 3. As it can be seen, the “Purchase” button is intentionally inactive. Then, GUI and its elements were designed in a sample page (Figure. 4) and according to scenarios and tasks all pages was designed and the demo software was complete.



Figure.3 Home page



Figure.4 The first sample page elements (Transfer page)

#### 4. Case Study

In order to evaluate the reliability of the designed device, a study was carried out. The aim of this study is to find out the following:

- To get acquainted with user's mental expectations interacting with system.
- To what extent is the designed interaction being successful?
- To what extent is the user able to make relation with the product?
- Observe user's errors and defects.

The evaluation was focused on the interaction between user and the device from point of view of the software design. The designer can't be a good and disinterested user to examine his design or express his opinion about it. Because of his total proficiency and awareness about all aspects, functions, activities, processes, errors and other issues related to the product. The best way to measuring the success of an interaction is to assess and examine by the target group. His reactions and feedbacks should be registered and being assessed.

#### **4.1 Material and Methods**

For this study a prototype was developed and a user interface demo was added to it. It was then evaluated in comparison with the current ATM. It was tried to make all the conditions similar for both groups. Sixty six students of College of Fine Art of University of Tehran were studied in two groups. The students were mostly from field of industrial design due to easy access to this group. Also people in this group are the ATM user and are familiar with such a technology.

36 people, 23 females and 13 males in the range of 20 to 32 years old were studied during using banking kiosk. 30 people, 10 female and 20 male in the range of 18 to 31 years old were studied during use of ATM of College of Fine Arts with similar conditions. For both groups a list of activities was given to each person. A short explanation about the procedure was given to each person. In order to measure the amount of conformity and also speed of data transferring, a film was made from each person during the process of using the device. They were also asked to fill a questioner form. In the first page of questionnaire there are a series of general questions about the products. In pages 2 and 3, the questions are about the process of using the machine. The data were gathered and were analyzed with SPSS and Matlab Software. To compare and analyze the data regarding Kiosk and ATM, if both variables were normal T-test was used; otherwise Mann-Whitney test was used.

### **5. Results**

The result of observational study were mostly qualitative, while through questioner quantities were gathered. Therefore, the result of observations and questionnaires presented in two separate parts. As the result of observational study the problems regarding using both banking kiosk and ATM were identified.

#### **5.1 Kiosk observations**

The result of Kiosk observations is as follow:

1. The most obvious problem of many people was the place of the "accept" key in num pad area. Most of users made a pause in finding this key.
2. Most of users had problem in choosing "Transfer" key, when they wanted to transfer money from their own account to another account. Some users chose another key after a long pause.
3. After completion of each process, there was no message that shows the end to users. And also movement of highlight on "progress bar" created this mistake for some users that the system was calculating yet.

4. Some users didn't pay attention to enter which ID for the inquiries in the stage of bill payment and they made mistake in entering IDs, or, even, they entered the account number instead of sum of money in transfer stage.
5. Some users didn't use the "return" key for the first time. However, they got use to it after first time.
6. Animations which were designed to show waiting, page changing, receipt printing and card receiving were satisfying for most of users, even some users were smiling in response to them.
7. In stage of change password, registration of previous password was necessary for almost all users and they entered their previous password when they were asked to enter the new one.
8. In one step of bill payment stage, a dash line was added after each four digits automatically in order to prevent mistake in entering long numbers. However, some of the users thought they made a mistake in entering data and tried to delete it.

## 5.2 ATM observations

1. Most users didn't trust to this system and even has a feeling of fear for using it.
2. Inflexibility of ATM keys created a sense of non-satisfaction and non-dominance in some users.
3. In case of using Mellat card (for Mellat bank ATM) number of payment transfer choices were so many that made the user confused.
4. Users were deprived to observe the entering data simultaneously because of separation of keys and the monitor, especially for entering long numbers.

## 5.3 Statistics

In order to compare banking kiosk with ATM, the gathered data through questioners were analyzes with T-test or Mann-Whitney test as explained before in methods. The result of this comparison is presented in table 1. Signs are used to explain the results of the comparisons for both tests, which are explained at the end of the table.

Table 1. Result of comparison

Question	Result of test	Result of diagram
Overall Feed back	+	++
Data entry	+	++
Element arrangement	+	++
Product aesthetic	+	++
Interface aesthetic	+	++
Time estimating	=	=
Physical conformity	+	++
Size & dimensions	=	=
Angle of view	!	++
Key placement	+	++
Interface contrast	+	++
Color tonality	!	++
Rate of trust	+	++
Result of Bill payment task	+	++
Result of Transfer task	+	+
Result of Invoice task	=	=
Result of Change password task	=	+

Sign	Definition
!	Test performance conditions failed
=	Equal in result
+	Improvement of new device Vs. ATM
++	Remarkable improvement of new device

In the questioner it was asked users to choose some adjectives between following adjectives for the device that they were tested These adjective are; Complicated, simple, Dull, Clever, Calm, Rough, Fresh, Withered. The result of these is presented in figure 5.

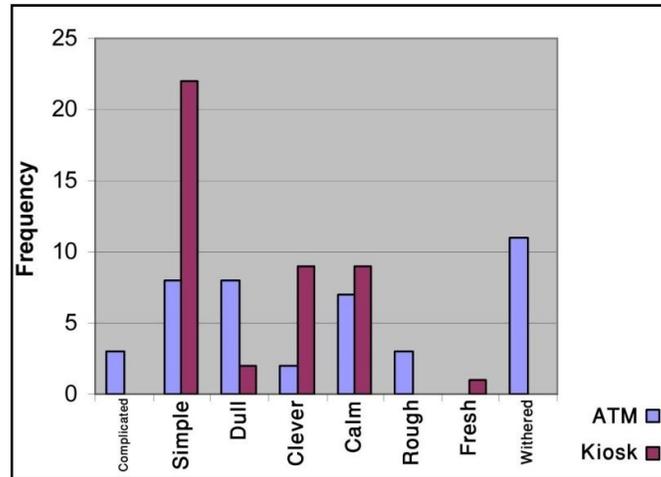


Figure.5 The result of comparing banking kiosk with ATM

## 6. Discussion and Conclusion

As the results showed the Kiosk performance as a new device was improved noteworthy in comparison with ATM as a current device. But some defects were observed, which are going to be discuss."Accept" key was placed under the text box to be observed easily. Therefore, user didn't need to traverse a long distance with his eyes and finger to achieve this key. However, users were looking for this key especially under the numpad with due attention to their previous experiences and habits in other systems (ATM, software, calculator, etc).

User's failure in choosing "transfer" shows that this title had not been understandable for users (in Farsi) and it couldn't transmit the considered message. Therefore, changing the title could suggest as a solution for transmitting this message. The best solution for such a problem is standardization. Standardization means use of a new (unfamiliar) thing, sign or word and try for defining and making it popular. Obviously, this thing should not be very strange to be accepted easily by user.

After completion of each operation, user should be assured that the operation is performed successfully. The absence of the message of "Operation complete" caused that users wait for a message. To solve this problem, completion operation message should be displayed after ending of each operation.

"Return" key was not used by some users. This reluctance of use was related to this fact that the role of this key couldn't be understood by them. However, those users who had used it one time were familiar with its role and used it again for other operations. Standardization is the best way to solve this problem too.

User's experience with other systems and software caused to create a series of patterns and standards for simulation in people mind. These patterns should be considered for better interaction.

In designing interaction, designers have to pay attention to users' patterns and habits. Start and end of every single task must be clearly defined and it is better to estimate the duration of it. It is better to keep users attention to the system when waiting for completing of a task. The repetitive tasks should be made attractive for the users. Therefore, it can be concluded that by performing the modifications the new device could meet most of the users' need. Development of such a device could help to improve banking system and make the banking procedures easier.

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