

**IN
PARTNERSHIP
WITH
PLYMOUTH
UNIVERSITY**

Name:

Student Reference Number:

Module Code: ISAD254SL	Module Name: Human Computer Interaction
Coursework Title: Kids Automatic Teller Machine System	
Deadline Date: 03.01.2017	Member of staff responsible for coursework: Ms.Nadeera Ahangama
Programme:	

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Group work:please list all names of all participants formally associated with this work and state whether the work was undertaken alone or as part of a team. Please note you may be required to identify individual responsibility for component parts.

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We confirm that we have read and understood the Plymouth University regulations relating to Assessment Offences and that we are aware of the possible penalties for any breach of these regulations. We confirm that this is the independent work of the group.

Signed on behalf of the group:.....
Vidanagamage Lasitha T B

Individual assignment:I confirm that I have read and understood the Plymouth University regulations relating to Assessment Offences and that I am aware of the possible penalties for any breach of these regulations. I confirm that this is my own independent work.

Signed:

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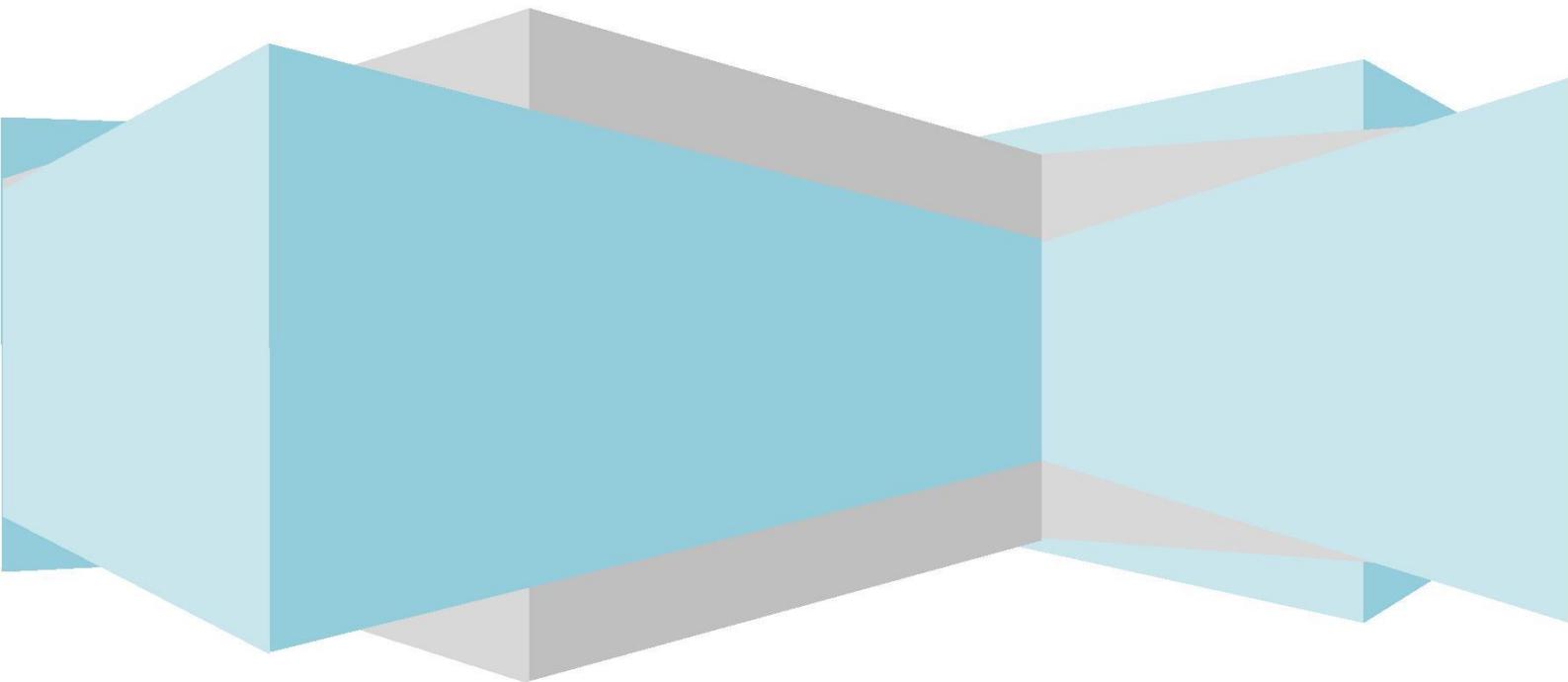


NerdLK
SOLUTIONS

PROJECT REPORT

ISAD254SL-Human Computer Interaction

**Touchscreen Interface for an ATM
Geared Towards Kids Aged 10-15**



NAME

Chirath Deelaka Perera
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NerdLK – PROJECT REPORT

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NerdLK

DESIGNING & DEVELOPMENT SOLUTIONS

NerdLK is a young and dynamic software development group that interested in new technologies. We are new comers to the development sector and we anticipate to get a experience from this project. Furthermore, we have active and well motivated members who willing to contribute.

TEAM MEMBERS & RESPOSIBILITIES

NAME	INDEX	RESPONSIBILITY
Chirath Deelaka Perera	10569217	Report , Proof Reading
Vidanagamage Lasitha T B	10569203	Photoshop Designing , Finalize
Wanniarachchi Hansini Himalshi	10569206	Designing & HCI Concepts
Wijesekara R W K A I Chathurika	10569058	Designing & HCI Concepts
Dharmagunarathna Sharan S	10569137	Designing & HCI Concepts



iNTRODUCTION

Introduction To Project:

The KIDS BANK Automatic Teller Machine (ATM) should provide facility to perform banking transactions to kids. This ATM geared towards kids under 10 to 15 whose parents have opened a savings account for them. KIDS BANK ATM will be located in public places such as at schools, bus stands, railway stations, shopping malls etc.

Through a finger print can access to the KIDS BANK ATM without using a ATM card. This system has touchscreen and no physical buttons. By using this ATM kids can withdraw money from savings accounts, deposit money to their accounts and check their remaining balance.

Concept and assumptions:

- In this system users cannot withdraw lower than fifty rupees.
- Users cannot deposit lower than fifty rupees.
- Users cannot use coins to deposit money to this ATM.
- Daily withdrawal limit is five thousand rupees.
- The system will not provide special features for disable users.

Technical specification:





- This touchscreen is in 10" width and height.
- The physical buttons are not implemented in this system.
- This is a scratch proof touch screen display.
- Fingerprint scanner will provide the authentication to the system through users' index finger.
- Receipt Printer will print receipts.
- Cash out tray can be used to withdraw money.
- Cash in tray can be used to deposit the money.

USER DESIGN PRINCIPALS USED

The usage of the design principles that have been implemented,

1. **Visibility** – Kids Bank uses various colors to distinguish the different buttons. There is some attempts to thematically assign colors depending on the action perform(e.g. -'Quick' button may be red, 'Yes' button may be green). Fonts will be displayed in white, to maintain the visibility of the text. buttons are noticeablebecause of its popped up effect and it gives real life experience to the user.
2. **Feedback** – System will provide details that what the current stage user is in. When the transaction is processing, process status screen will be displayed.
3. **Constraints**– To enter the system we used finger print scanner behalf of ATM card because kids cannot memorized the ATM pin number and they might be missed place ATM card. In this system ATM daily withdrawal limit is Rs. 5000.00.Therefore, system has been used limited text box to enter the withdrawal amount.
4. **Mapping**—After authentication is completed,user name and account number is always shown on the right top corner of the system since people are more used to look for it on the right side. Back and quit button is mapped in the middle left side so the users understand the purpose of the button.
5. **Consistency**– The whole system uses the same colors throughout and follows the same fonts, font sizes and positions in every page. Users will always feel that they're inside the system they're supposed to be.
6. **Affordances**– Buttons used in the system look like real world buttons with bevel look and feel so the users know from experience that they can be clicked upon.



Usability heuristics.

- Visibility of system status.

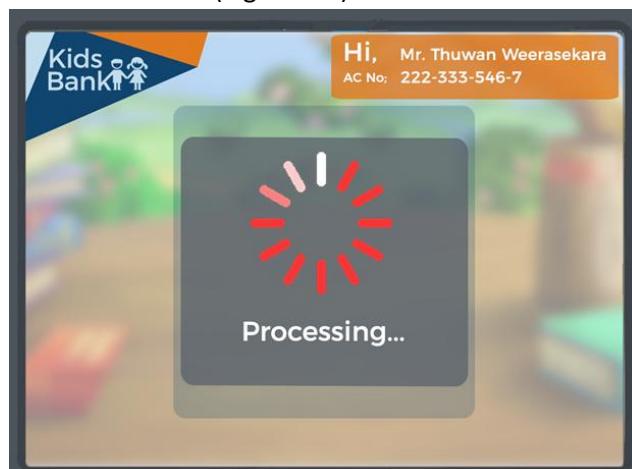
- 'The system should always keep users informed about what is going on through appropriate feedback within reasonable time'. In this 'Kids Bank ATM', the visibility of system status heuristic helps to design user friendly interface.

-When users deposit money to their accounts, system will provide feedback about details of the deposit amount and account number(Figure 2.0).



Figure 2.0

-Displaying a processing status screen, users can realize they must wait till the next screen (Figure 2.1).





- Match between system and the real world.
 - *'The system should speak user's language with words phrases and concepts familiar to the user, rather than system orientated terms. Follow real world conventions making information appear in a natural and logical order'.*
 - Implementing regularly using words like fast cash, withdraw money, deposit money, and check balance will perceive the above point(Figure 2.2).



Figure 2.2

- User control and freedom.
 - *'users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo'.*
 - Users often use system functions (Figure 2.3).
 - Used Back button to go to the previous state and quit button to leave the system without having go through(Figure 2.3).
 - In the keypad system used clear button layout to minimize the typing mistakes (Figure 2.3).
 - 'Zero' button is larger than other keypad buttons because it is the frequently used button (Figure 2.3). -System placed 'one' button above the 'zero' button to overcome the inconsistency of numeric keypad(Figure 2.3).



Figure 2.3

- Consistency and standards
 - 'users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions'.*
 - Users should not have to wonder whether different words, situations, or actions mean the same thing. Use same font to the system words, same alignments to the buttons and user friendly colors such as red color to 'QUIT' and 'NO', green color to 'OK' and blue color to 'BACK' (Figure 2.4).
 - Use same background color and same theme to all the screens (Figure 2.4).



Figure 2.4

- Error prevention
 - 'Even better than good error messages are a careful design which prevents a problem from occurring in the first place'.*
 - System prevents unauthorized access to the system (Figure 2.5).



- System prevents the withdrawal when user's current balance is lower than withdrawal amount (Figure 2.6).
- System prevents withdrawal when daily limit is exceeded (Figure 2.7).
- System prevents depositing lower than 50 rupees (Figure 2.8).
- System prevents withdrawal lower than 50 rupees (Figure 2.9).

-Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution(Figure 2.8).



Figure 2.5



Figure 2.6



Figure 2.7

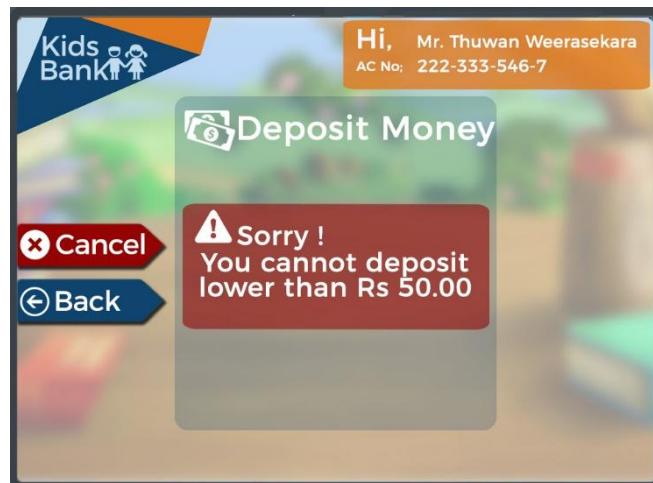


Figure 2.8



Figure 2.9



- Recognition rather than recall:

'Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate'.

-This interface user can quickly access in shortcut buttons like withdrawal, deposit, fast cash and check balance(Figure 2.10).

-But no need to memorized what are the shortcut keys are. Also user can access through the yes button(Figure 2.10).

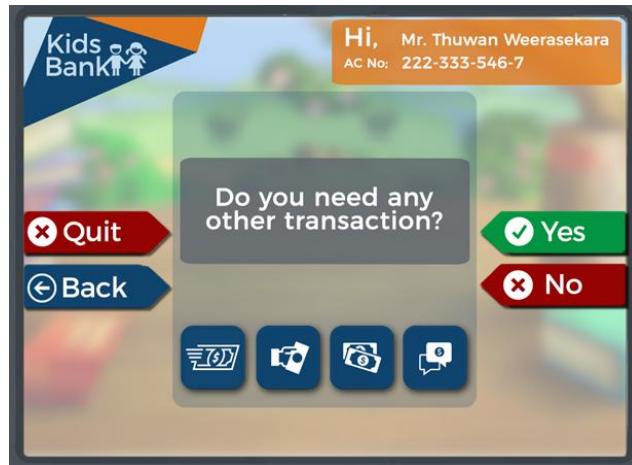


Figure 2.10

- Flexibility and efficiency of use.

accelerators –

'unseen by the novice user- may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions'.

There are three types of users.

- 1.Novice users.
- 2.Intermittent users.
- 3.Expert users.



Novice users and intermittent users can use this options with using labeled buttons, expert users can use the shortcut buttons(Figure 2.11).



Figure 2.11

- Help users recognize, diagnose, and recover from errors



Figure 2.12



USABILITY METHODOLOGY

- Learnability –

System gives instructions by its self. This will save learning time of the user who use the system for the first time. When user use Cash In or Cash out, system gives instructions by blinking .

- Efficiency –

System perform more efficiency by using Shortcut buttons. Then user have to achieve few steps to get the tasks.

- Memorability -

System use icons that have more priority to memorize by using important elements such as fast cash, deposit, withdraw, check balance .

- Errors –

System keeps a minimum error rate.

- Subjective Satisfaction –

When user depositing cash he/ she does not need to enter the amount that the want to deposit. It will be automatically counted by the system.

User does not need to type the account number. System will automatically recognize user account through the finger print.



USER PROFILES

a. Target user description

Age Group	10 -15
Gender	Male Female
Ethnicity	Sinhalese Tamil Moors Burghers
Income	Higher Middle Lower Middle
Locality	Urban Semi Urban
Height	4.5
Eye Sight	Good
Size of Hands	Finger Print



Physical Ability	Healthy
IT Literacy	Good Average
Language	Sinhala Tamil English
Financial Proficiency	Good Average



b. User profiles



Meashal Fernando is a 10 years old kid who is born to a family of Doctors. He studies in Royal Collage, Colombo 07. Meashal is a very smart kid at his age. He is good in IT skills and fluent in English. His parents will be work at Meashal's school time & after school tuitions time. So they opened an account in Kids Bank to let him withdraw food Expenses. He is excellent in managing and finances at his age.



Safra Mohammad is a 11 years old. She studies in Zahira College Kalmunai. Her father works in abroad and he can't come annually to see her. So Safra's parents opened an account in Kids Bank. Safra is born in higher middle family having a good financial proficiency. She is also good in managing finances too. She has general knowledge in IT. And also fluent in English.



Uma Krishnamurthy is a 13 years old. She has born to a family of farmers in Jaffna. After passing her scholarship exam at Grade five she moved to the Visaka Vidyalaya in Colombo. She is all-rounder in school and attends tuition after school. She has excellent skills for IT and also she is fluent in English and Tamil. Uma stayed at boarding house so her parents opened an account in Kids Bank to let her withdrawal for Uma's expenses. Her managing financial is very well.

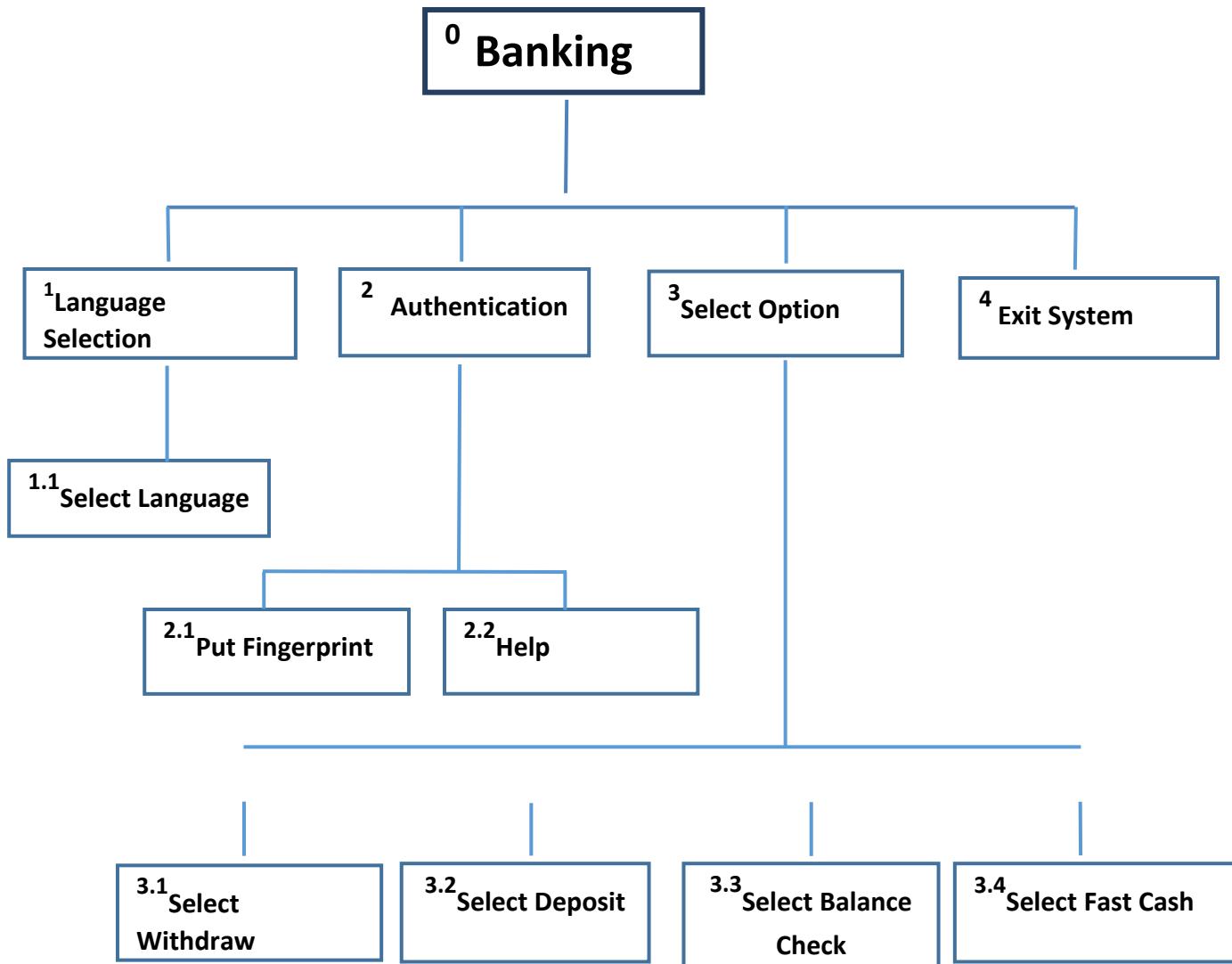


Dasun Amarasekara is 15 years old. His father is a Teacher and his mother is a housewife. Dasun studies in Siridhamma College, Labuduwa. Dasun is excellent in IT skills. His fingers are bigger than his friends. He is very busy with his studies because he has to face Ordinary Level exam in next year. So Dasun attends tuition after school in every week. His parents will be at work at that time so they opened an account in Kids Bank to let him withdraw transport and food expenses.



TASK ANALYSIS DIAGRAMS

General HTAs (General Hierarchy Task Analysis)



- Plan 0

Do 1
Do 2
Do 3
Do 4

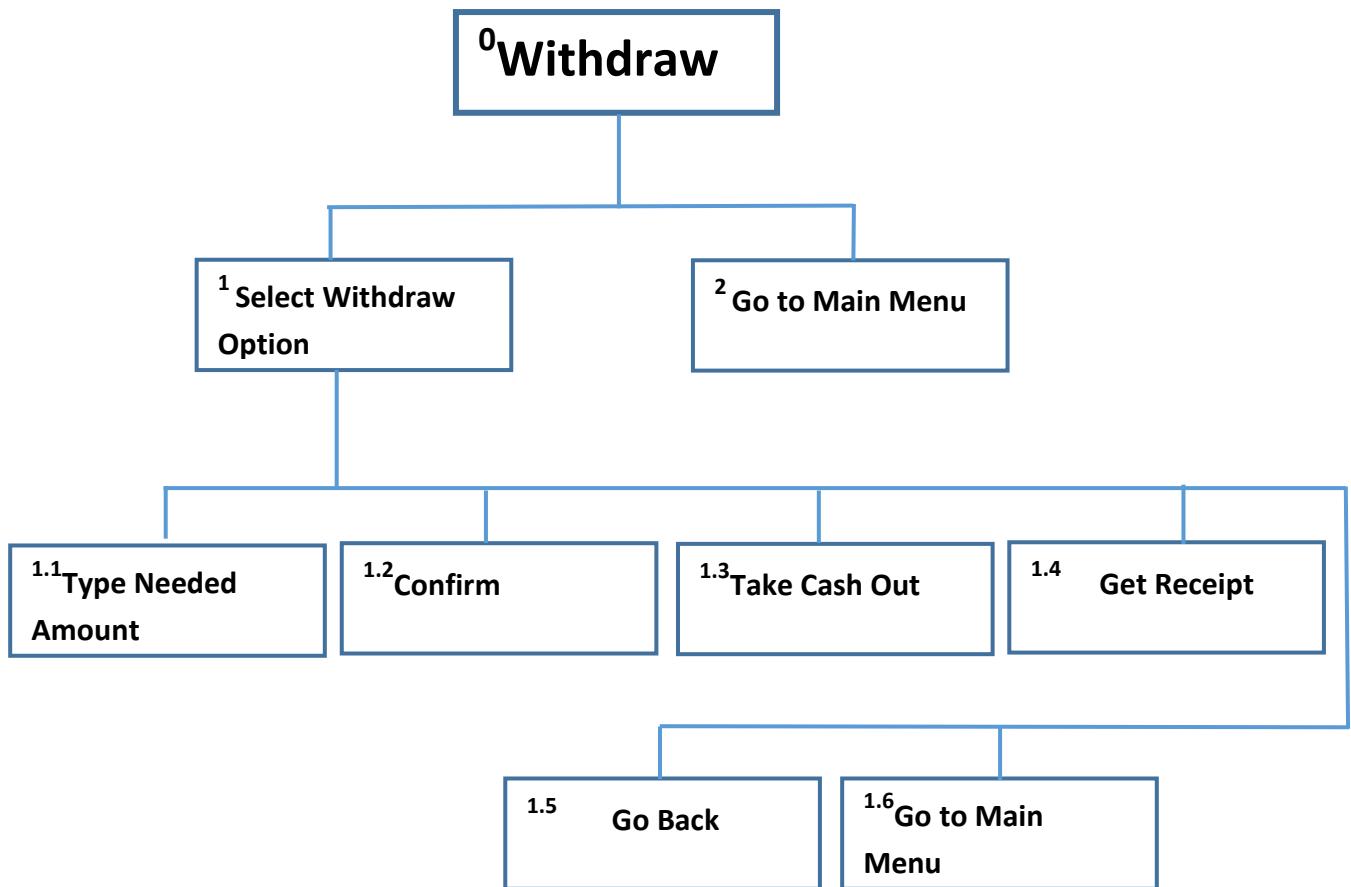
- Plan 2

Do 2.1 or 2.2



- Plan 3
Choose 3.1, 3.2, 3.3, 3.4

Specific HTAs (Specific Hierarchy Task Analysis)



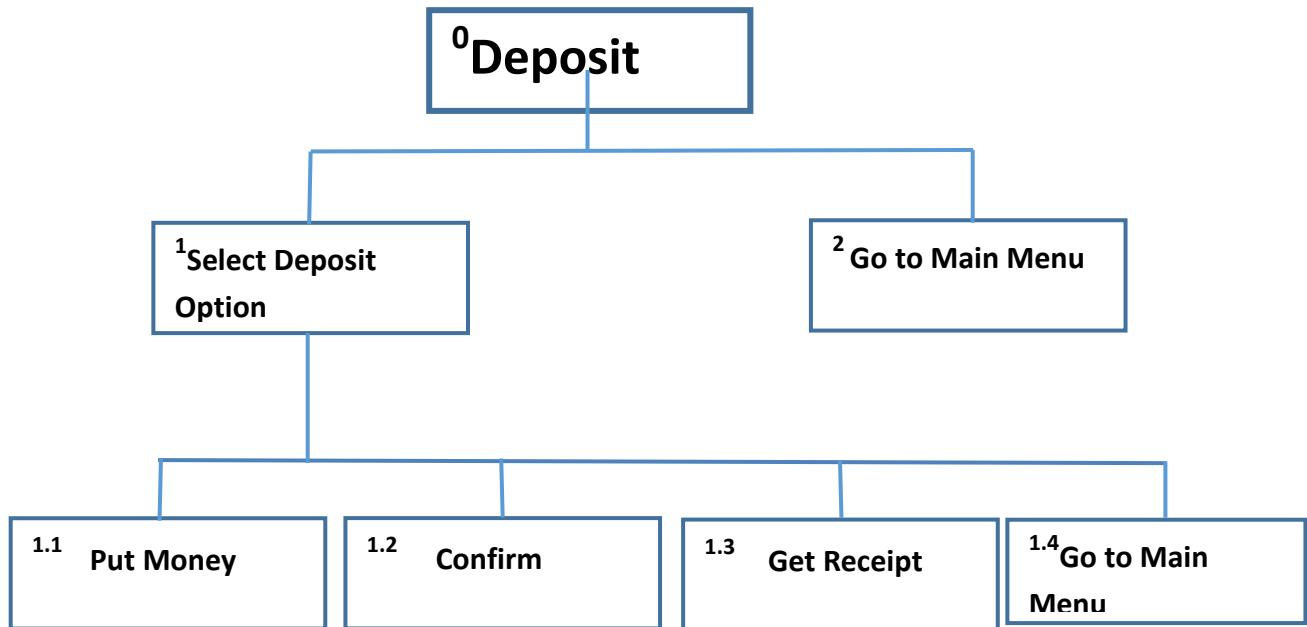
- Plan 0
Select 1
Select either 2
- Plan 1
Do 1.1
Do 1.2
Do 1.3



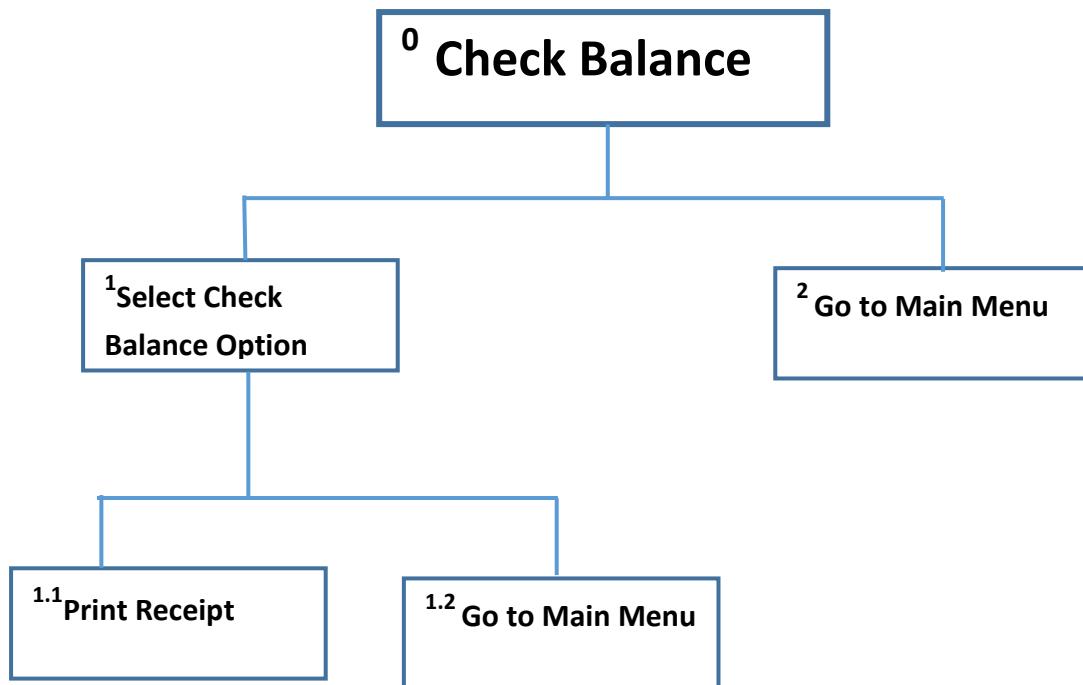
Do 1.4

Anytime reverse Do 1.5

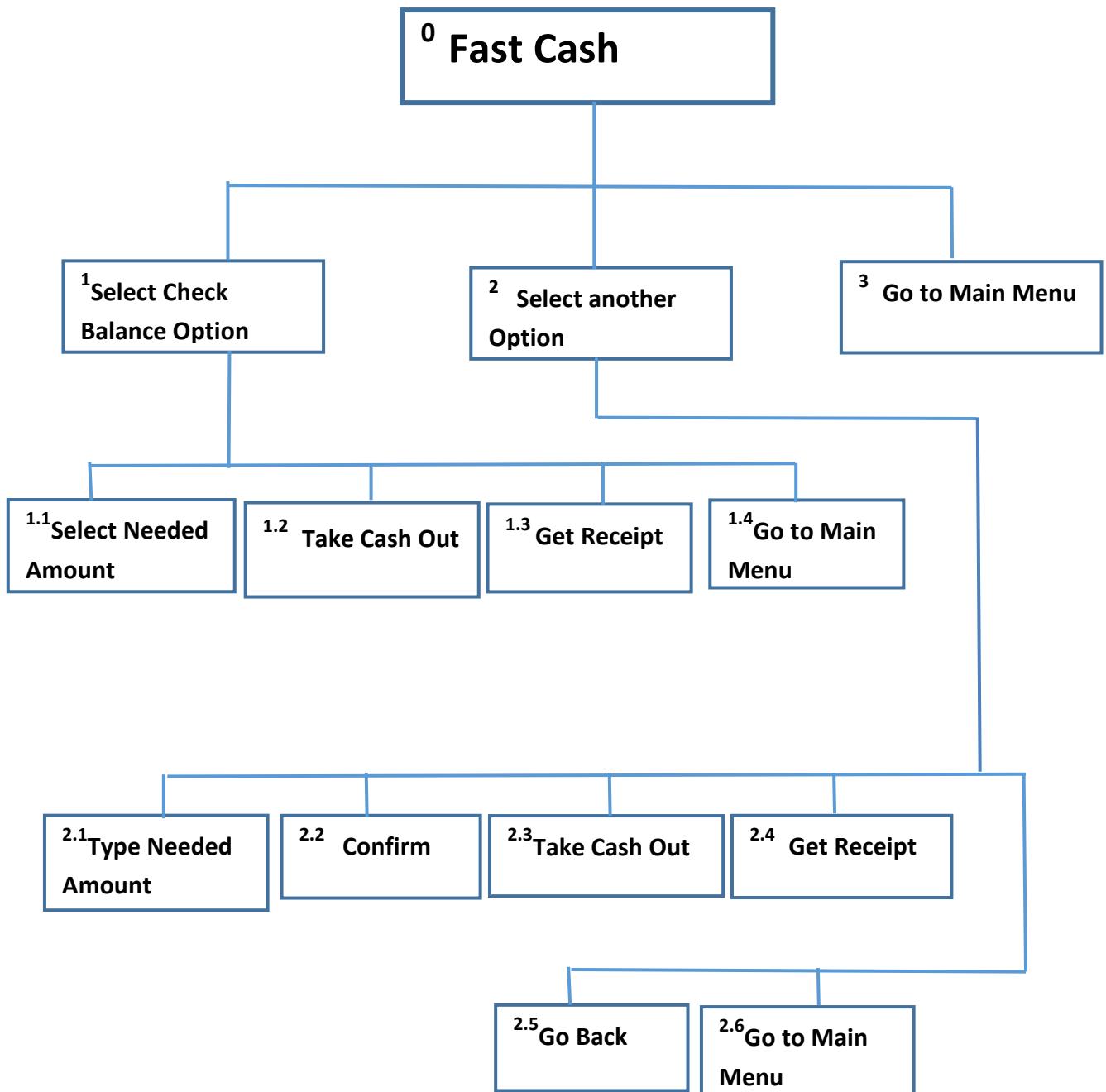
Do 1.6



- Plan 0
Select 1
Select either 2
- Plan 1
Do 1.1
Do 1.2
Do 1.3
Do 1.4



- Plan 0
Select 1
Select either 2
- Plan 1
Do 1.1
Do 1.2

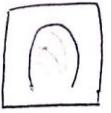


- Plan 0
Select 1
Select either 2 or 3
- Plan 1
Do 1.1
Do 1.2
- Do 1.3
Do 1.4



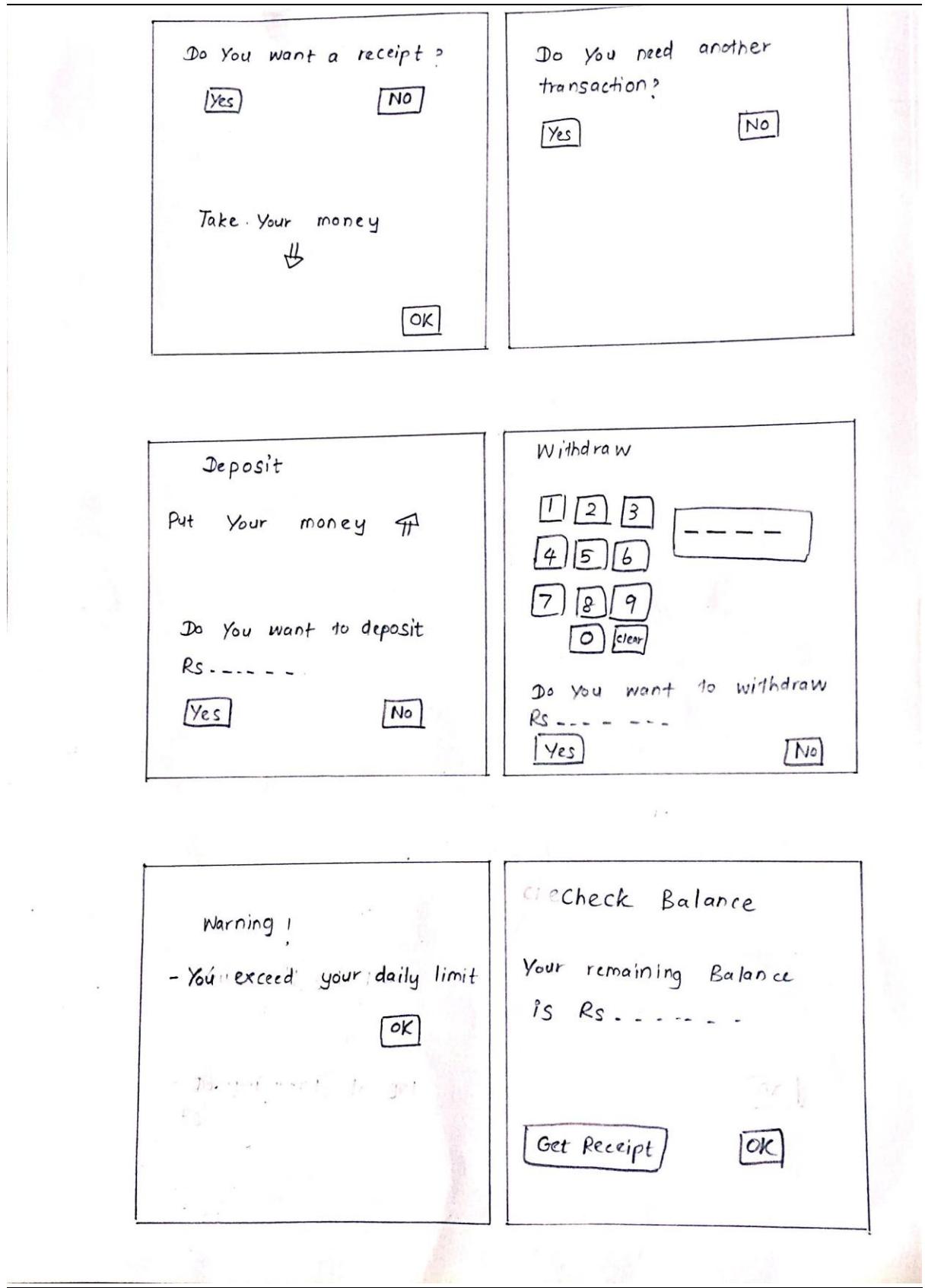
PARALLEL DESIGN SKETCHES

Sketch 01

<p>HELLO KID</p>  <p>Get Start</p>	<p>Put Your Finger Print</p> 
---	--

<p>Warning ! Finger Print is not match. Try Again</p> <p>OK</p>	 <p>FAST CASH Deposit Withdraw Check Balance</p> <p>Back</p>
---	---

<p>FAST CASH</p> <p>Rs. 100.00 Rs 1000.00</p> <p>Rs. 500.00 Rs 5000.00</p> <p>Back</p>	<p>Do You Want to get Rs -----</p> <p>Yes NO</p>
--	---



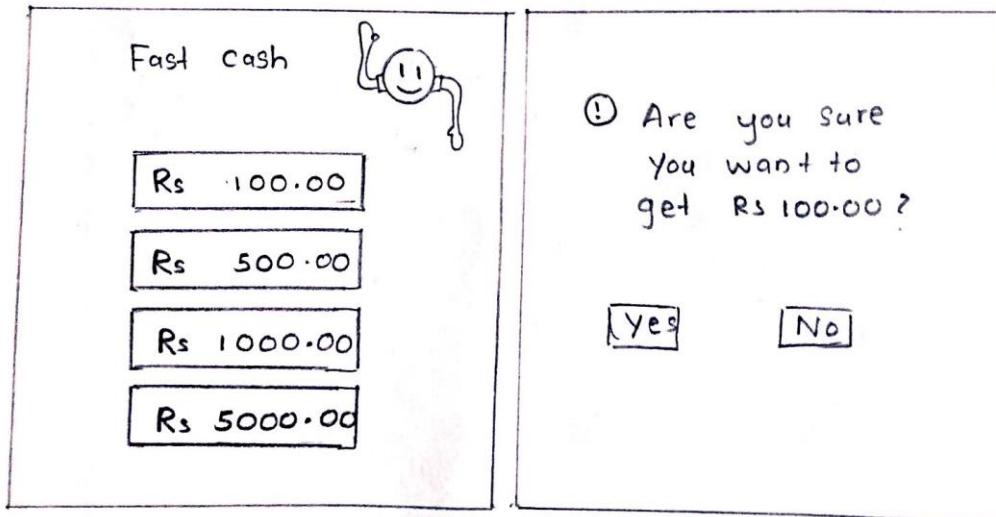
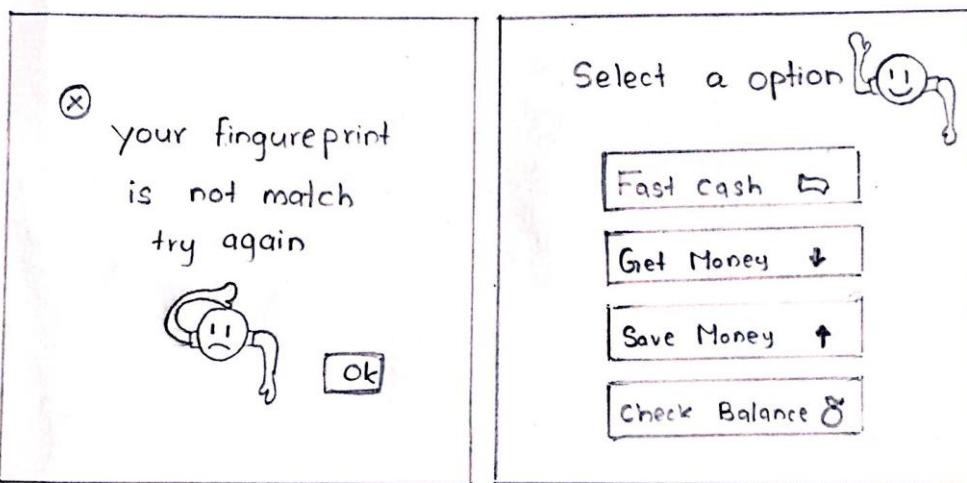
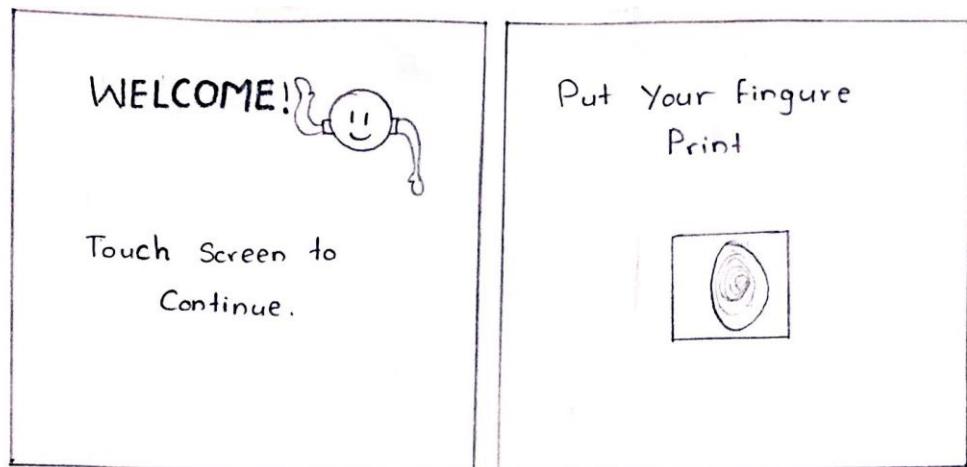


Bye Bye

Have a nice day!



Sketch 02





Do you need another transaction ?

yes

No



Take your money here

Get Money



Get Money

1	2	3
4	5	6
7	8	9
0	clear	

Save Money

Put Your Money Here

Save Money



Your Money is transferred to your Account

OK

Check Balance

Your Balance is
Rs 4000.00

OK



Thank You
Come again !





Welcome
to
KID ZONE

Go

Enter Your Pin Number

1 2 3
4 5 6
7 8 9
0

Clear

Back

GO

Select the language

English

සිංහල

தமிழ்

Select what you want

Fast Cash

Withdraw

Deposit

Check Balance

Back

Go

Fast Cash

Rs. 100 Rs. 500

Rs. 1000 Rs. 5000

No Receipt Print Receipt

Take your money

withdraw

Back Exit Go



With draw		
Amount	-----	
1	2	3
4	5	6
7	8	9
0	Clear	
Back	GO	

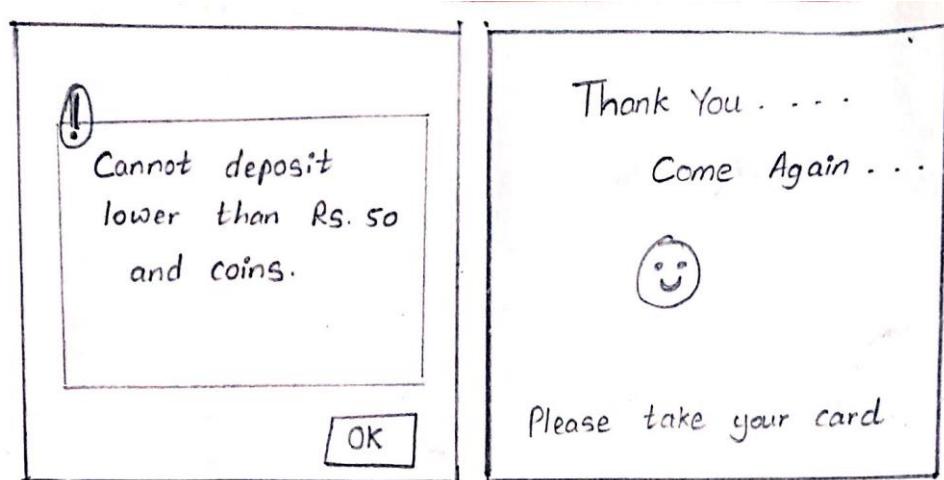
No Receipt	Print Receipt
Take your money	
Back	Go

Done ...	
Return card	More Options
Back	Go

Deposit	
Deposit your money	
deposit	↓
Back	Go

Done	
Rs .1000.00 deposit to your account.	
Return card	More Options
Return card	More Options

Check Balance	
Remaining balance Rs:.....	
Return card	More Options



JUSTIFICATION FOR THE SELECTED DESIGN

- Language selection option –

We designed the system to Sinhalese, Tamils', Muslims', Burgers' users.

- Finger print scanner –

There is high security using finger print scanner than using pin number.

- Error prevention-

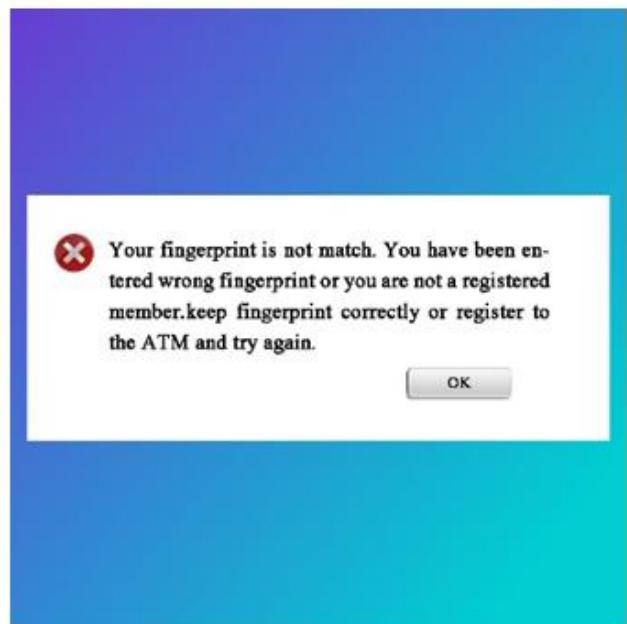
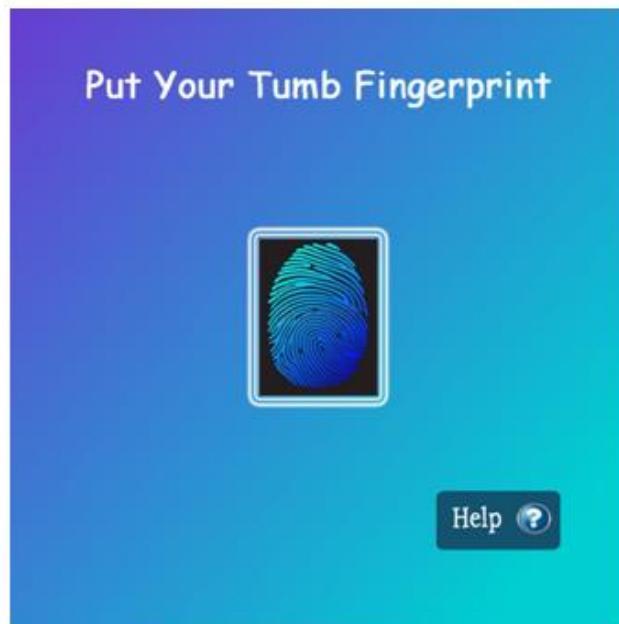
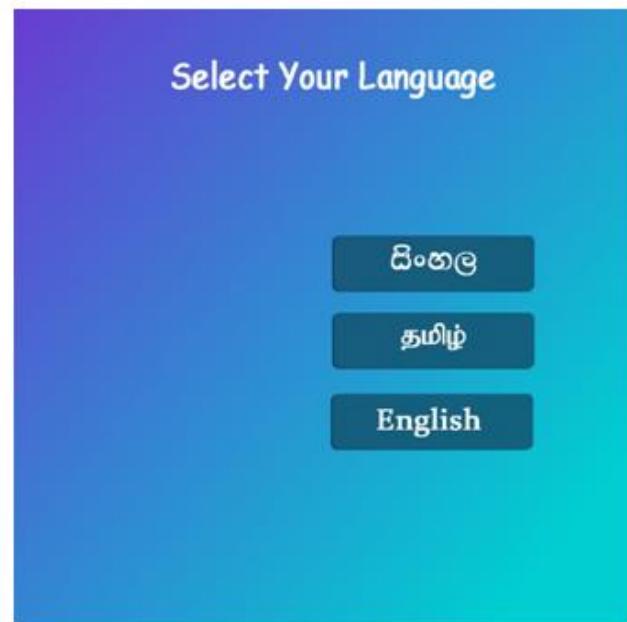
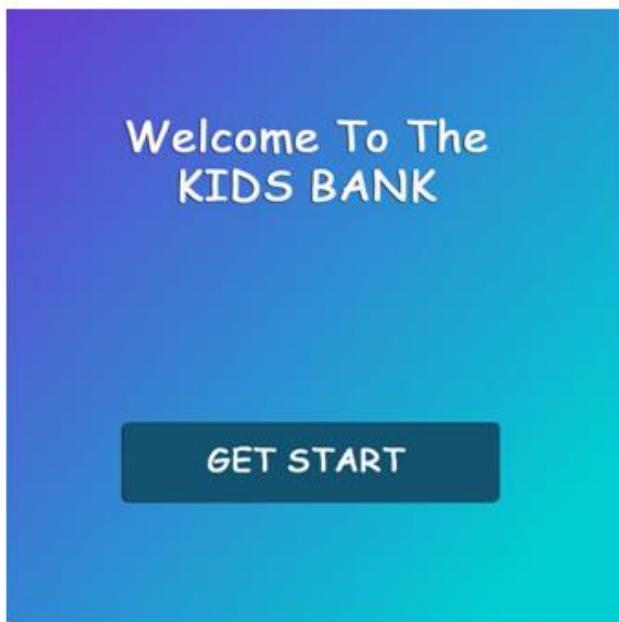
We use fingerprint error message to prevent errors.

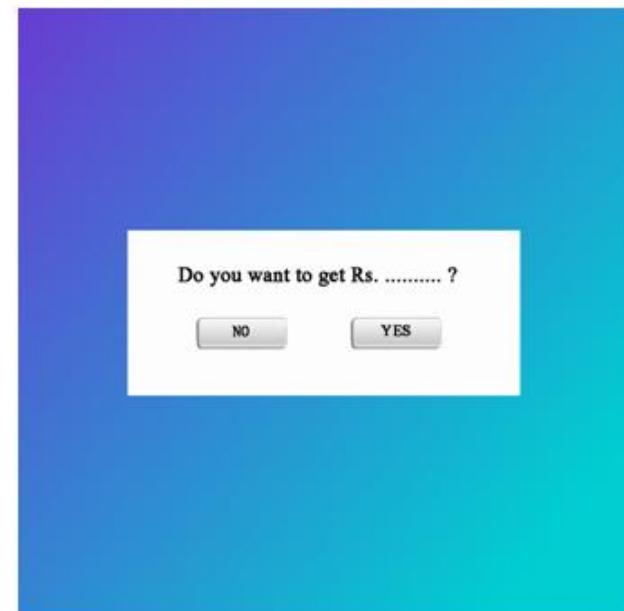
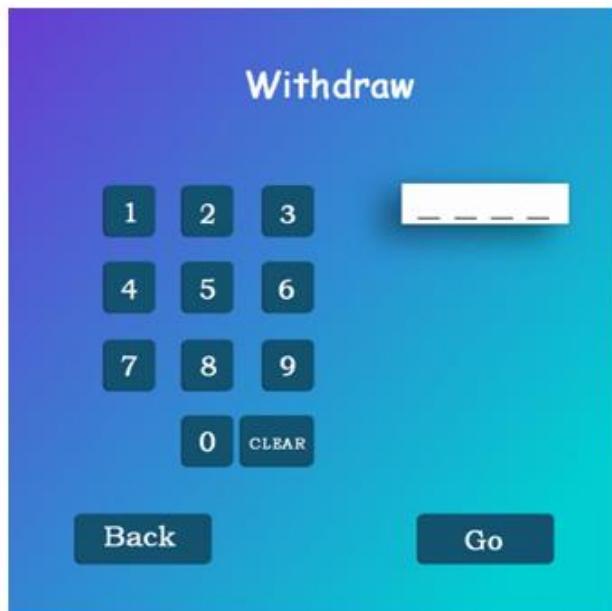
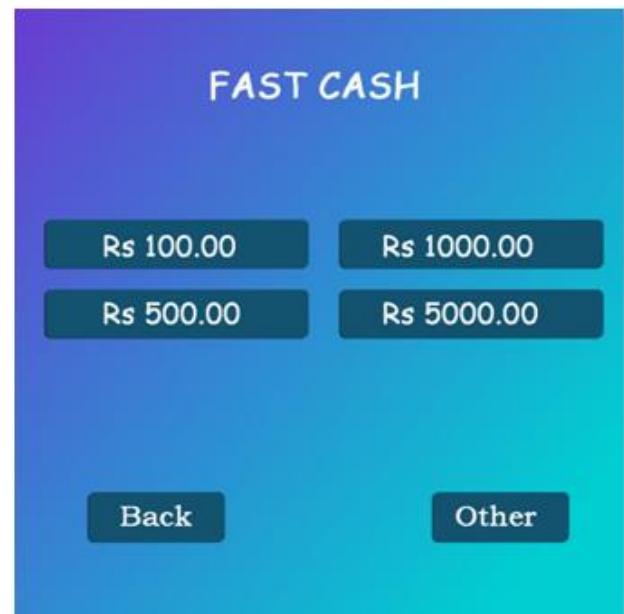
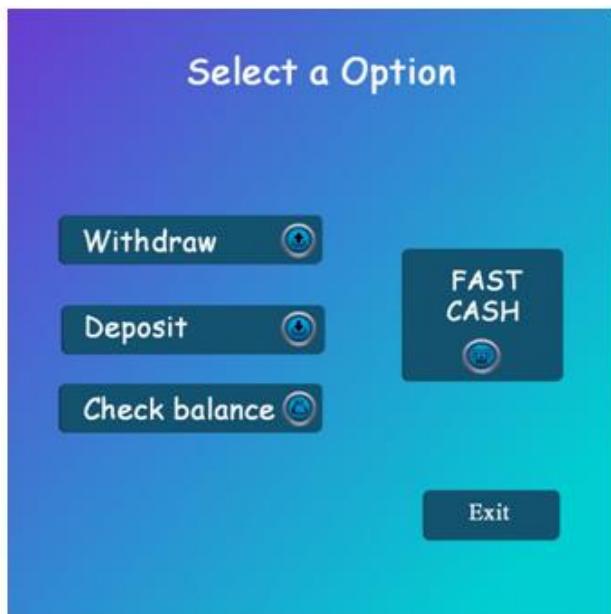
- Suitable for target users

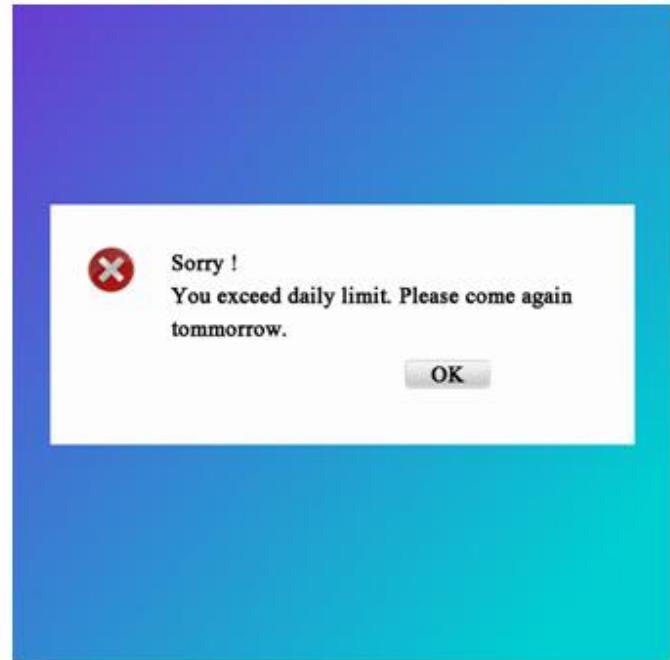
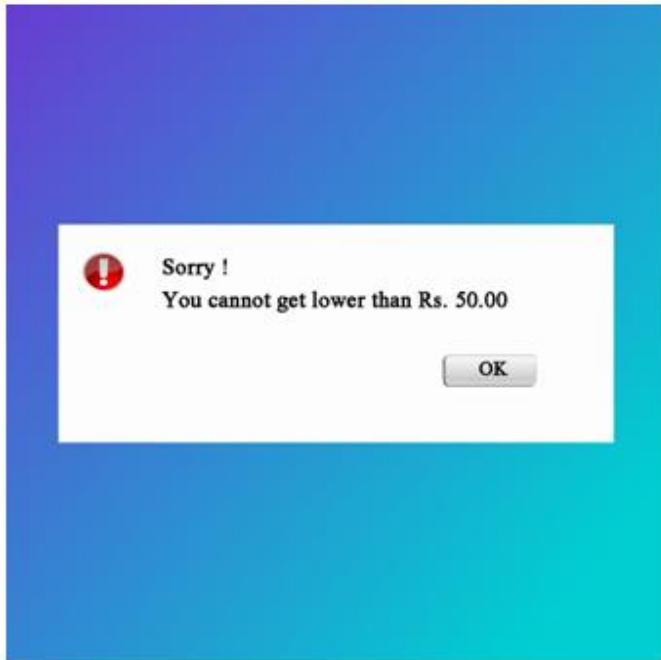
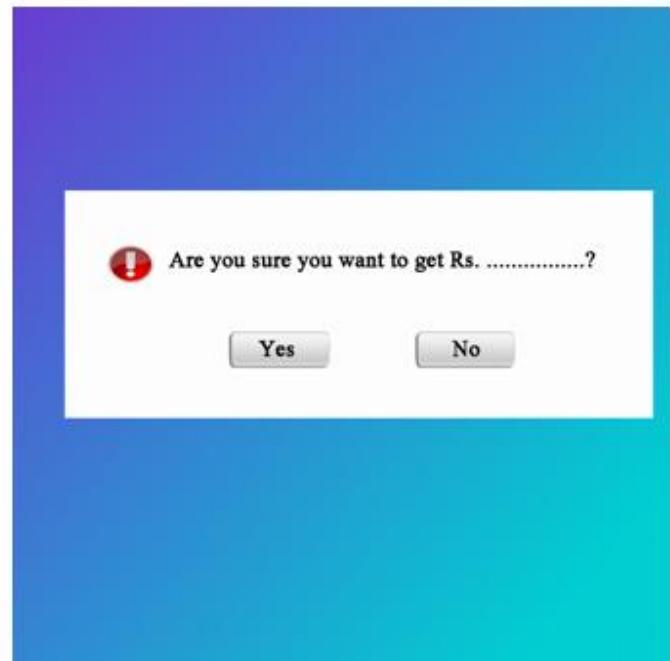
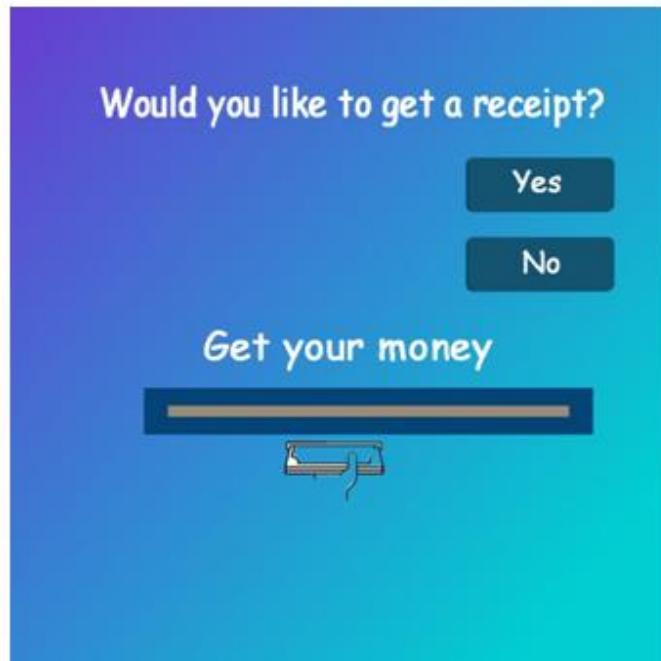
- Button shortcuts

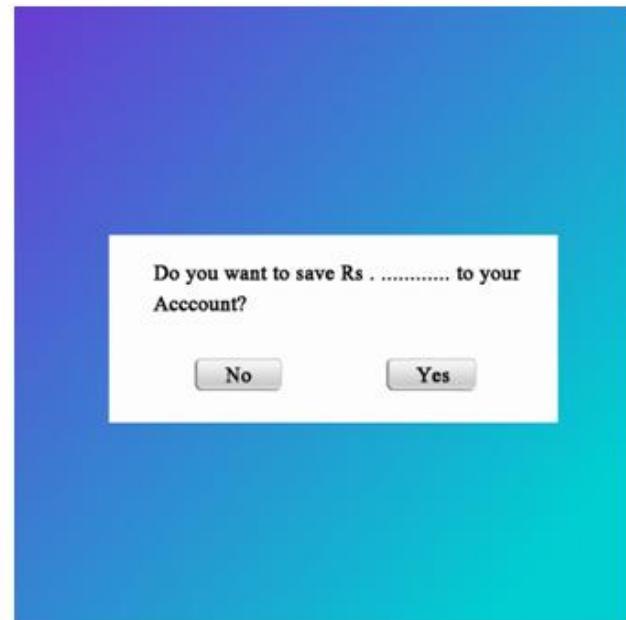
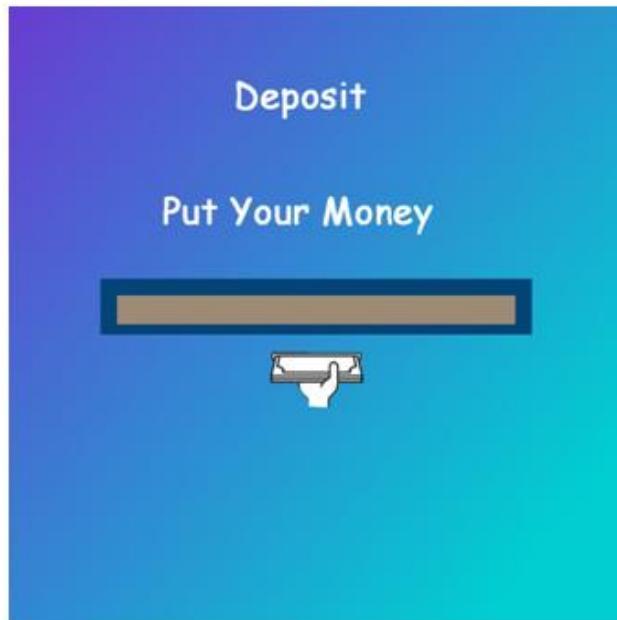
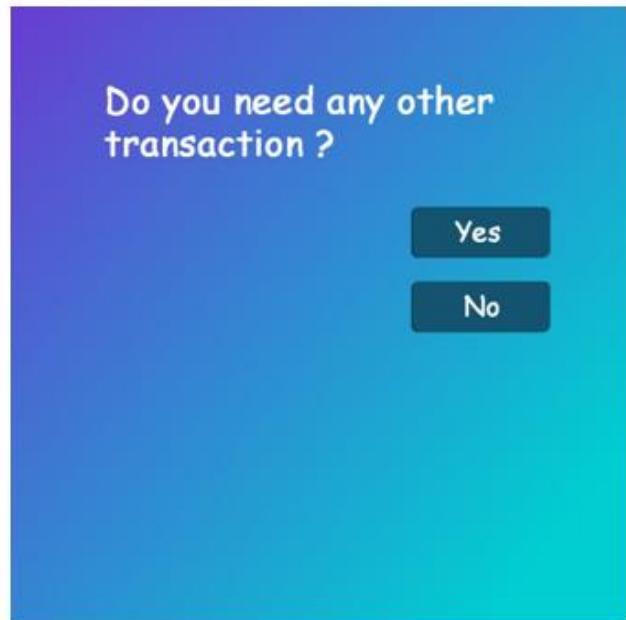
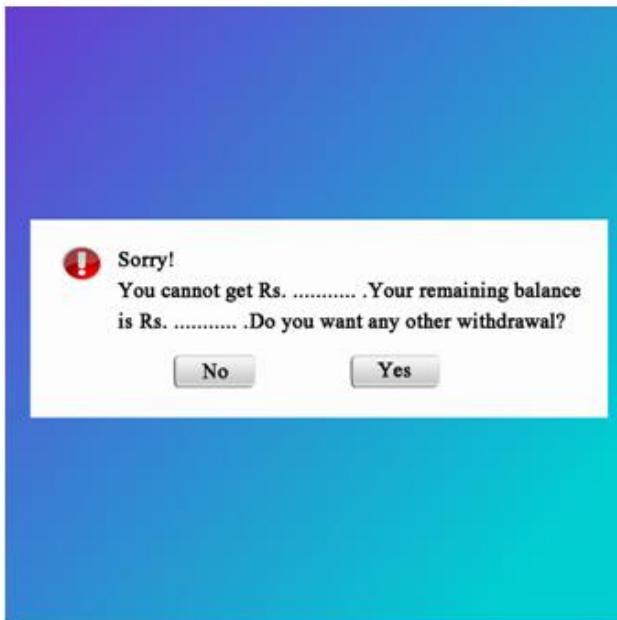


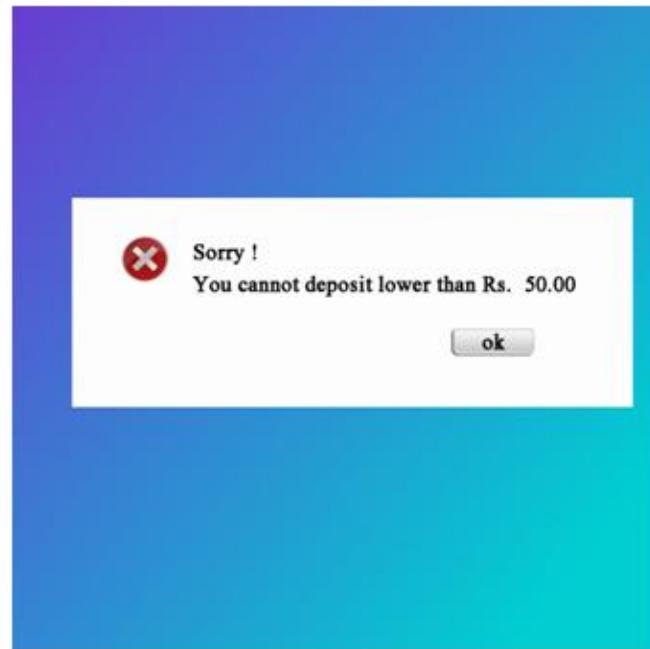
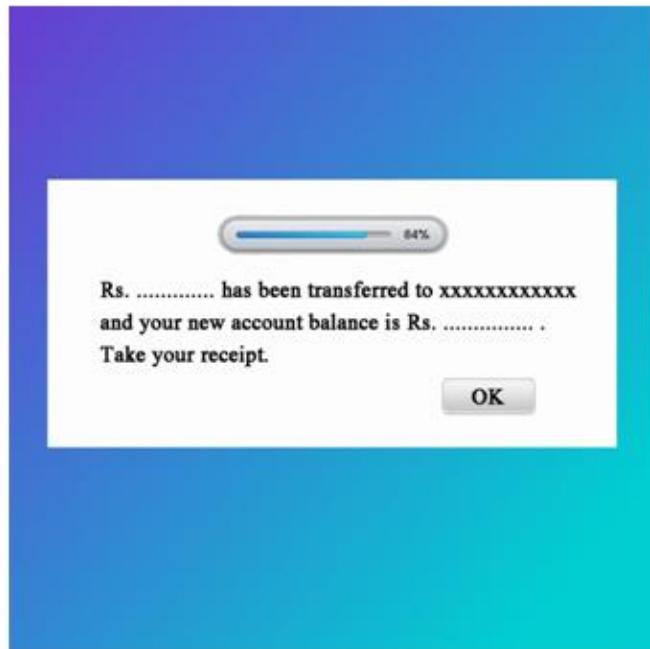
PARTICIPATORY DESIGN SKETCHES











Check Balance

Name of the Acc.Holder :

Acc.number :

Remaining Balance :

Print Receipt **Go**

THANK YOU !
Have A Nice Day



PROTOTYPE.

-Technical specification.

We use finger print scanner to access to the system. Therefore unauthorized users cannot enter to the system.

-Screen designs with description and justification of used design concepts.

- a) This is the welcome screen of KIDS BANK ATM system. Users can enter to the system by clicking the **OK** button (Figure 9.0).



Figure 9.0

- b) In the second screen users have facility to select language among English, Sinhala and Tamil(Figure 9.1).



Figure 9.1

- c) This screen shows users can access to the accounts by put their finger print to the scanner. Clicking Quit button users can leave the system and clicking Back button users can go back to the previous page (Figure 9.2).

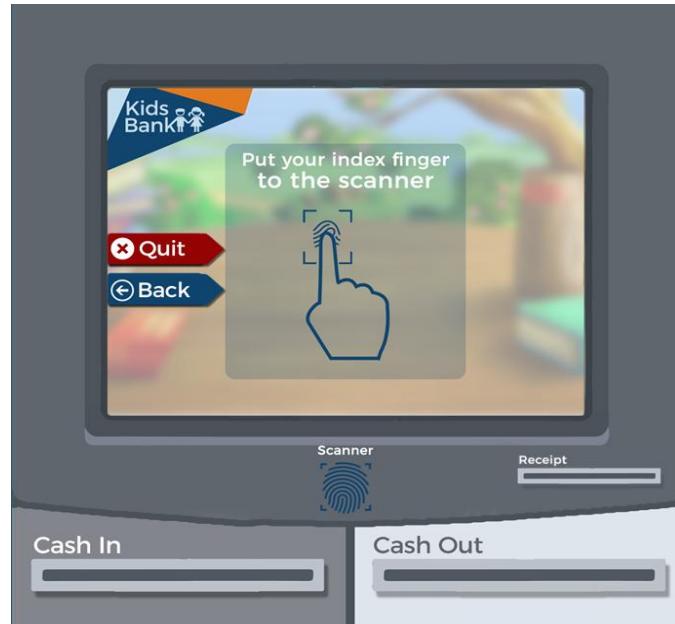


Figure 9.2



- d) If users put their finger print in wrong way this warning message will be display. Quit button and Back button perform same as previous page (Figure 9.3).

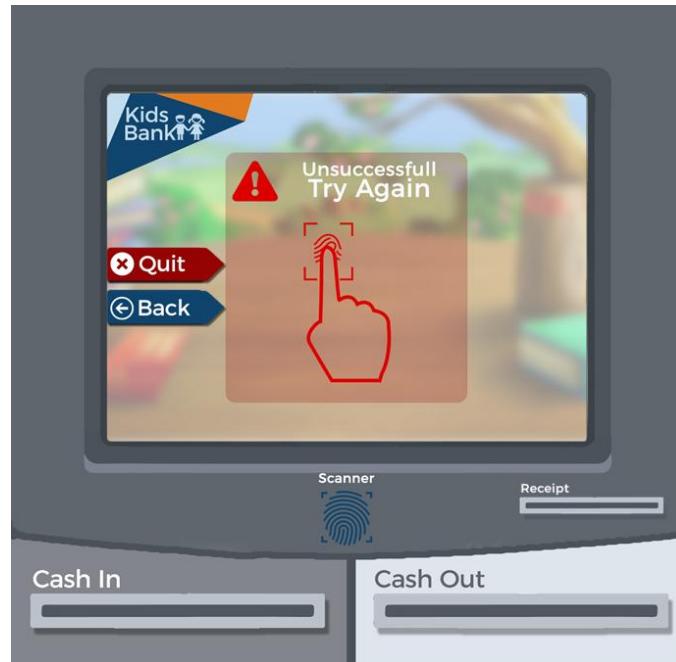


Figure 9.3

- e) This message will be shows users put their finger print in correct way (Figure 9.4).



Figure 9.4



- f) This interface is the main function of this system. In this ATM system provide users to four main facilities. Such as Fast Cash, Withdraw Money, Deposit Money and Check Balance. Clicking these four buttons users can enter to the next level. If user want to get money as soon as they can go to the fast cash method. Users can use withdrawal method to get money with typing cash amount with their own. Deposit method use to deposit money for their account. If users want to check their remaining balance they can go to check balance method by clicking check balance button. Quit and back button perform as the same way (Figure 9.5).

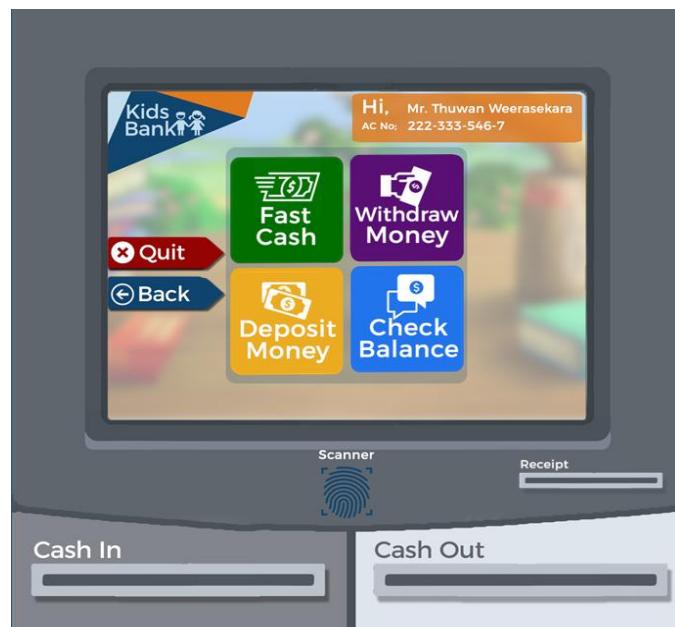


Figure 9.5

- g) In the fast cash interface users have four options. Selecting button can get amount that mentioned in button. By clicking other button page will move to the Withdrawal money interface. Quit and back button perform as the same way(Figure 9.6).





- h) This message will show if user click amount button asking kid that do they want to get that money. If user click yes button, then move to the processing screen. User can click no button if this screen shown by mistake. Quit and back button perform as the same way (Figure 9.7).



(Figure 9.7)

- i) This is the processing screen. It's take few minutes to move to the next interface (Figure 9.8).





- j) After displaying processing screen move to this interface. It shows users to take their money in the cash out tray which blinking green color. By clicking ok button screen move to the next interface (Figure 9.9).



Figure 9.9

- k) By clicking the ok button screen will move to this interface asking kids about do they need any other transaction. If user needs other transaction they can click yes button. Then screen again move to main interface of this system if not they can click no button screen move to the last interface in system. Users can move to the main methods by clicking shortcut buttons. Quit and back button perform as the same way (Figure 9.10).



Figure 9.10



- I) When user click Withdrawal money button screen move to this interface. User can type amount in the text area. While amount typing if number clicked by mistake user can use number erase button. If kid wants to clear amount they can use clear button. When user type amount and click ok button, screen move to another screen asking receipt from user. If user clicks ok, then print a receipt. No button is use for if user does not want a receipt. Then screen move to processing screen. Quit and back button perform as the same way (Figure 9.11).



Figure 9.11

- m) This interface shows how to withdraw money. Cash out tray will highlight in green color. Quit button and back button will act same as above (Figure 9.12)



Figure 9.12



- n) This page will show a message box to confirm if they surely want to get that amount. Page will move to get receipt interface when user press "Yes" button. Clicking No button page will move to Withdraw money interface. Quit and back buttons are performing same as other interfaces (Figure 9.13).

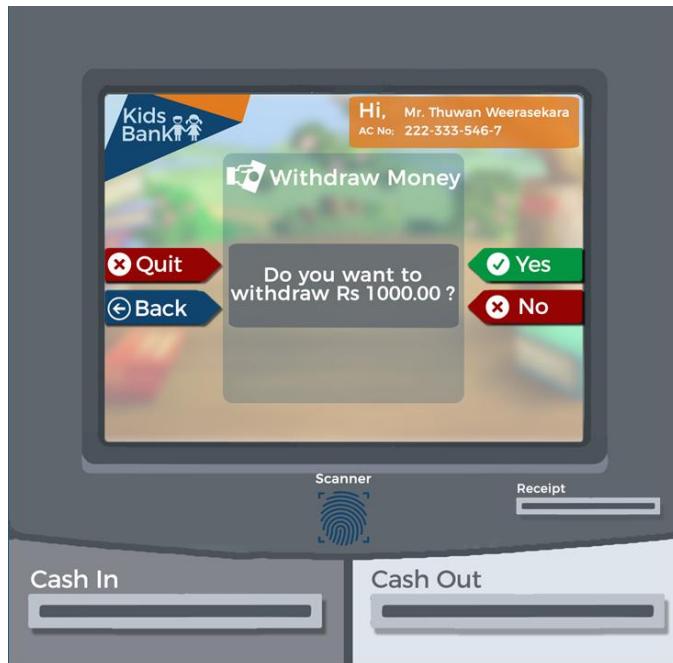


Figure 9.13

- o) In this page user can get receipt if they mind. By clicking yes button receipt will print and clicking no button page will move to other transaction interface. Quit button and back button will act same as above (Figure 9.14).



Figure 9.14



- p) This interface shows how to Deposit money. Cash in tray will highlight in green color. Quit button and back button will act same as above (Figure 9.15).



Figure 9.15

- q) This page will show a message box to confirm if they surely want to deposit that amount. Page will move to get receipt interface when user press "Yes" button. Clicking No button page will move to Deposit money interface. Quit and back buttons are performing same as other interfaces (Figure 9.16).



Figure 9.16



- r) This page will show to the user if deposit was successful. Ok button will move this page into asking receipt page. Quit button and back button will act same as above (Figure 9.17).

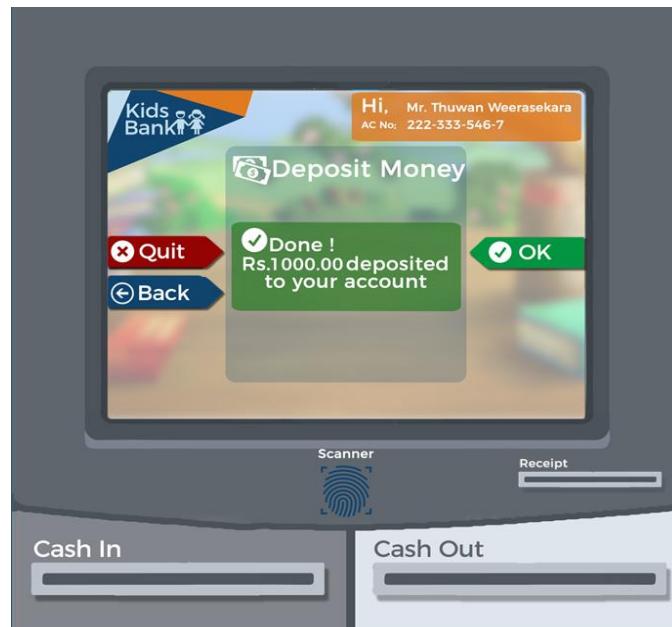


Figure 9.17

- s) In this page user can get receipt if they mind. By clicking yes button receipt will print and clicking no button page will move to other transaction interface. Quit button and back button will act same as above (Figure 9.18).

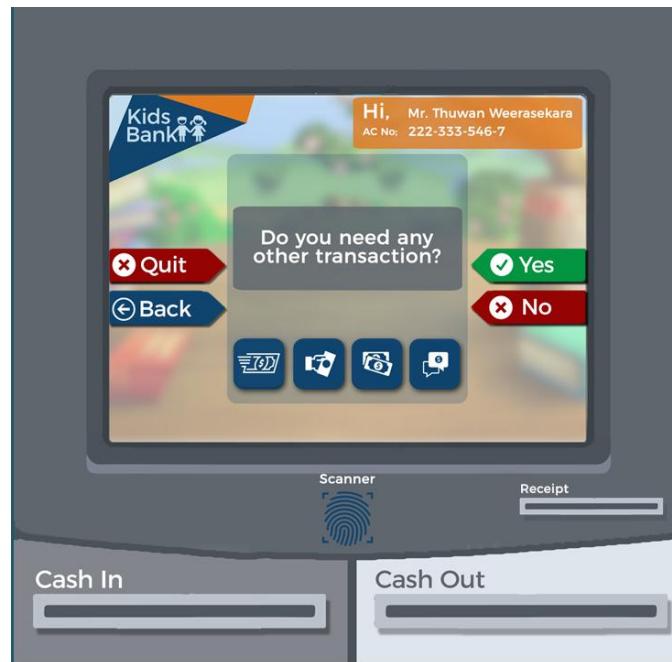


Figure 9.18



- t) This page will give an error message when kids try to get lower than Rs.50.00 by clicking ok button page will move to withdrawal money main interface. Quit and back buttons are performing same as other interfaces (Figure 9.19).



Figure 9.19

- u) When users account balance is not enough then this error message will show to the user. By clicking ok button screen move again to withdrawal money main interface. quit and back buttons are performing same as other interfaces (Figure 9.20).



Figure 9.20



- v) This page also gives an error message when kids try to get higher than Rs. 5000. By clicking "OK" button page will move to Main interface. Quit button and back button will act same as above (Figure 9.21).



Figure 9.21

- w) When user try to deposit lower than RS.50 then this interface will show. Ok button id uses for go to again deposit money interface. Quit button and back button will act same as above(Figure 9.22).

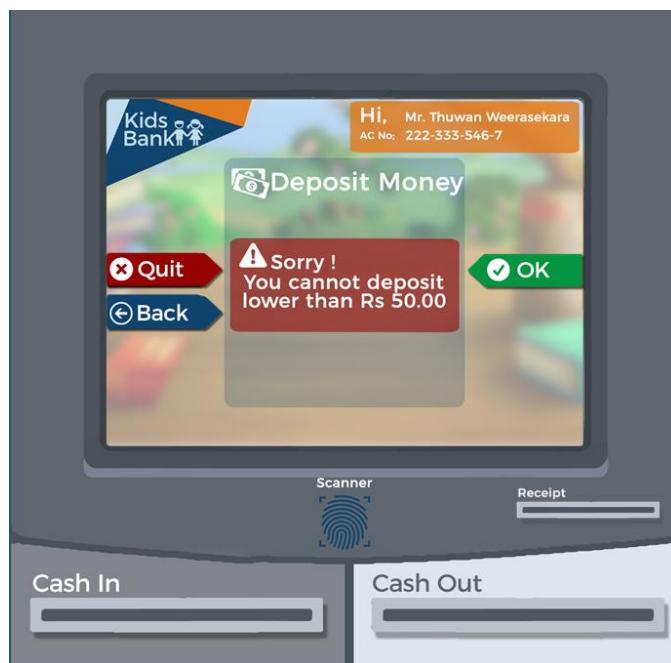


Figure 9.22



- x) This interface shows user account balance. They can get a receipt about transitions by clicking print button. Quit and back buttons are performing same as other interfaces (Figure 9.23).



Figure 9.23

- y) This is the final interface in this system. After few minutes it will move to the welcome interface (Figure 9.24).



Figure 9.24



USABILITY EVALUATION

a) Formative

- Quick and dirty.

Method-

- ✓ Shows the system to the Mrs.Nadeera Ahangama and students in the university to get idea about the system.

Results-

- ✓ No user Friendly colors.
- ✓ Less security.
- ✓ Button are not in same alignments.

Improvement-

- ✓ Use user friendly colors to the buttons.
- ✓ Red color use to quit and no button.
- ✓ Green color use to yes button.
- ✓ Blue color use to back button.
- ✓ Change the background color.
- ✓ Make button alignments in correct way and use same theme for all interface

CONCLUSION

The Automated Teller Machine (ATM) is designed to improve kids' managing and financing skills. This system is design with design principles. This whole system is user friendly and in higher security. Kids can improve their ability to saving and daily expenses.

We plan to improve our design by eye deflection system for more security purpose. And hope to design a new ATM for 16+ children.



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