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Assignment M3
CS 6750 – Human-Computer Interaction
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The project that my group and I will be working on is Redesigning ATMs (Automatic Teller Machines). I assumed that a user is purchasing goods at some sort of physical marketplace and doesn't have a form of payment available. For my brainstorming plan, I want to come up with ideas to design a way for a user to access their account through an ATM without having a debit card. While brainstorming, I need to keep in mind the standards in security that ATM's already have in place and not interfere with those. I hope to have the brainstorming done within a couple hours. The only rule here would be that the user does not have their debit card available. Otherwise, the ideas should be free form. In some cases, the ideas can be divulged from other ideas.

Now that I have completed brainstorming, I have come up with a couple ideas. The first idea would be to have the user enter in their bank's routing number as well as their account number and pin to their debit card. This is additional steps, though, and also forces the user to remember that personal information. Another idea is using fingerprint scanners or other biometric scanners on the ATM, but this represents a definite cost increase as well as additional security implementations in ATM's. My final idea would be a key fob on your keychain that allows you to access the ATM the same as your debit card would while still requiring your pin number and other information. A fourth, and final idea, would be to allow someone to use their phone to access the ATM. This idea already seems to be in place, but isn't implemented in most places.

For my selection criteria, I need to make sure that the security of the ATM remains intact. I also want to make the process as easy as the current the process when accessing your account information at an ATM. Building on that, the familiarity and consistency of the interface shouldn't change much, just the ways the process begins. This is such things as timeliness, typical UI layouts, and more. I don't want the user to have to fumble around when trying to withdrawal money. So for these reasons, I have selected the key fob, the phone app, and the process of entering in the routing and account numbers.

For the phone app idea, I will try to use a verbal prototype. Many people already have apps on their phone to access their account, transfer money from one account to another, and do many other things that the ATM can be used for. Unfortunately, it cannot be used to actually withdrawal money from an ATM. If an ATM were to use Bluetooth or other Near Field Communications, it could easily connect with any smartphone. The ATM interface wouldn't change in this instance. It would, instead, just adapt to use the bank's app that they already have. The phone could connect to the ATM, pass over the user's account information, and the next step would require the user to enter in their PIN (personal identification number) into the ATM. The user would continue to get through the standard process of getting money out, while skipping the process of having to provide their debit card. This also addresses the issue in my data inventory of skimming devices. Skimming devices won't be helpful to the unlawful as no debit card will be used. The design is fairly easy to use for most users and only requires a smart phone with the app of the bank that the user is a customer of.

For the idea of having the user enter in their own information, I have created some paper prototypes. It is my idea that the user would first be asked if they want to use their debit card or if they want to manually enter in their bank's information. If they choose manual, they will be required to enter in their bank's routing number as well as their account number and PIN. After they have entered in their

PIN, the screens would continue on in the same fashion that ATM users are accustomed to. If they were to choose debit card, they would skip entering this information in. Again, if they choose to manually enter in their information, this handles the issue in my data inventory of not needed to worry about getting your card skimmed. Where it does lack security is with the keypad. If a keypad overlay is used to gather information for unlawful use, then the unlawful person has much of the user's personal information. Security, though, isn't effected much by this design as we already deal with these issues in real life. You will find my paper prototype drawings at the end of this paper.

For my third idea of the key fob, I will use a textual prototype. For background, the ATM will need to implement Near Field Communications much like in first prototype of using a phone app to access your ATM. The key fob will have the user's bank data registered and the ATM will be able to read that using a low strength Bluetooth or other NFC. In this instance, the user can either use the key fob given to them by the bank or use the debit card that was given to them by their bank. This also alleviates the card skimming issue in my data inventory, as well as not having their debit card. It does not decrease the security in anyway.

- Scenario: the user is at an ATM that allows key fob access. The user has a need to access their account, withdrawal money, and/or perform other functions. The user does not have their debit card or phone, nor do they remember their account number. They do have a key fob that has been given to them by their bank.
- User walks up to ATM
- User selects "use key fob" function rather than inserting debit card.
- User places key fob on the ATM.
- ATM asks the user for their PIN
- User is able to withdrawal money, check balance, and any functionality that is offered when a user uses their debit card.
- User ends the transaction however they typically would at that specific ATM.

Hello. Welcome to YourBank ATM.

Please select an option

Use Debit Card

Manually Enter Information

1 2 3 Clear

4 5 6 Cancel

7 8 9 Enter

0

Screen 1: Choose Manually Enter or Use Debit Card

Please tell us if you would like to withdrawal from a
YourBank bank account or a different bank

YourBank Account

Different Bank Account

1 2 3 Clear

4 5 6 Cancel

7 8 9 Enter

0

Screen 2: Choose the current bank's routing number or enter in a different bank's routing number

Please enter the 9-digit routing number of the bank you would like to withdrawal from and then press "Enter"

123456789

1	2	3	Clear
4	5	6	Cancel
7	8	9	Enter
	0		

Enter Routing Number Screen

Please enter the account number of the account you would like to withdrawal from

1245678461654984916

1	2	3	Clear
4	5	6	Cancel
7	8	9	Enter
	0		

Enter Account Number Screen

Please enter your PIN and then press "enter"

XXXX

1 2 3 Clear

4 5 6 Cancel

7 8 9 Enter

0

Enter PIN Screen

Assignment M3

Due: Sunday, October 30th, 2016, by 11:59PM [UTC-12 \(Anywhere on Earth\)](#). This assignment is based on lesson 3.4 and 3.5 (Design Alternatives and Prototyping), and focuses on brainstorming and prototyping design alternatives.

Assignment Instructions

Answer the following prompt in a maximum of 1200 words, with a recommended length of 1000 words; if you supply more than 1200 words, the grader will stop reading at the 1200th word, and you will not receive credit for anything written after that. You are encouraged but not required to complement your responses with diagrams, drawings, pictures, etc.; these do not count against the word limit, though any captions, text in tables, etc. does.

Brainstorm multiple design alternatives for your chosen problem space, then select a handful and construct low-fidelity prototypes to use in evaluation. First, outline a brainstorming plan (~50 words). Explicitly note the rules you will follow, the time you will allocate to brainstorming, and the standards you will meet before moving forward. Then, execute your individual brainstorming plan and report the ideas you provided. This may be reported simply as a flat simple descriptions of ideas (~100 words). While the length of this portion of the deliverable is shorter, it is no less important, and will be evaluated as a disproportionately high percentage of the overall assignment's grade.

After brainstorming several alternatives, detail the selection criteria you will use to select which three ideas to move forward to prototyping. This may take the form of the rules that will be applied to selecting the alternatives to move forward, or this may take the form of an explanation of the more situated reasoning behind why certain alternatives are selected. In short, explain how the alternatives to move to prototyping either will be or were selected (~100 words).

Once you have selected those three ideas, construct their prototypes. Each idea should be prototyped in a different way: a textual prototype, a verbal prototype, a paper prototype, or a basic Wizard of Oz prototype. For textual prototypes, sufficient detail should be provided that the user could give useful feedback on the idea. For verbal prototypes, the prototype should include a script for what would be described, as well as answers to anticipated questions. For paper prototypes, a minimum of one screen should be supplied. For Wizard of Oz prototypes, a script of user actions and the system's responses should be supplied. For each prototype, supply a description of the prototype (~150 words for paper and text prototypes, equivalent depth for paper or Wizard of Oz prototypes). Then, for each prototype, note specifically how the prototype addresses or fails to address items from the data inventory and/or requirements definitions from the previous assignment (~100 words per prototype).