

BIOMETRIC POINT OF SALE SYSTEM

By

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A SENIOR THESIS PROPOSAL

Presented to the Faculty of

The Computer and Electronics Engineering Department

In Partial Fulfillment of Requirements

For CEEN 4980 Senior Thesis Proposal

Major: Electronics Engineering

The University of Nebraska-Lincoln, Omaha Campus

Spring, 2003

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January 31, 2003

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The accompanying Senior Thesis Proposal, "Biometric Point of Sale System," is submitted in accordance with the requirements of CEEN 4980, Senior Thesis Proposal. As stated in the proposal, the project will be done for and funded by Rich Bailey, Brian Connor, and Bryan Dissinger.

Respectfully yours,

Rich Bailey, Brian Connor, and Bryan Dissinger

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I. BACKGROUND

The students have recognized the need for a more simple and secure point of sale (POS) system at local retail outlets. Current POS systems require the customer to have several items on his/her possession to complete the sale. These items can include the following: identification, credit cards, loyalty cards, debit cards, and checking account books. The team feels that these items, being in the technological age that we are, are a burden for the customer. Therefore, the team is setting out to find a method for creating a system that eliminates the need for these items, resulting in a more convenient and comfortable way to shop.

II. THESIS OVERVIEW

The following description is of how the system works. Imagine yourself at a local retail outlet – for simplicity we will say your neighborhood grocer. You finish obtaining your groceries for purchase and you proceed to the checkout. At the checkout, the clerk rings up your groceries as normal and gives you a total. You then, assuming you already signed up with the store for the service, scan your fingerprint on the biometric sensor located at the checkout. The sensor identifies you securely and safely. The system then pulls up information about you from the database. This information includes your name, payment options, and age (for age verification for the purchase of tobacco and alcohol). Payments options are presented to you and your name and age is presented to the clerk.

The system then automatically scans your loyalty card that you have on file with the company (i.e. Bakers ® Value Card). You proceed to select your method of payment

from the touch screen in front of you. These methods of payment are up to you, for you may select to have certain credit cards or checking accounts on file with our system. After you choose your method of payment, your purchase is complete. Imagine the ease and comfort of being able to go to the store with nothing at all.

III. GENERAL DESCRIPTION

The system will consist of five main sections or parts. These parts include the terminal, microcontroller, touch screen, fingerprint scanner, and computer port. The following is an explanation of each of these items.

Terminal: This will be the monitor at the cashier station. The monitor will display the user's information which will include that person's name, age, and other pertinent information.

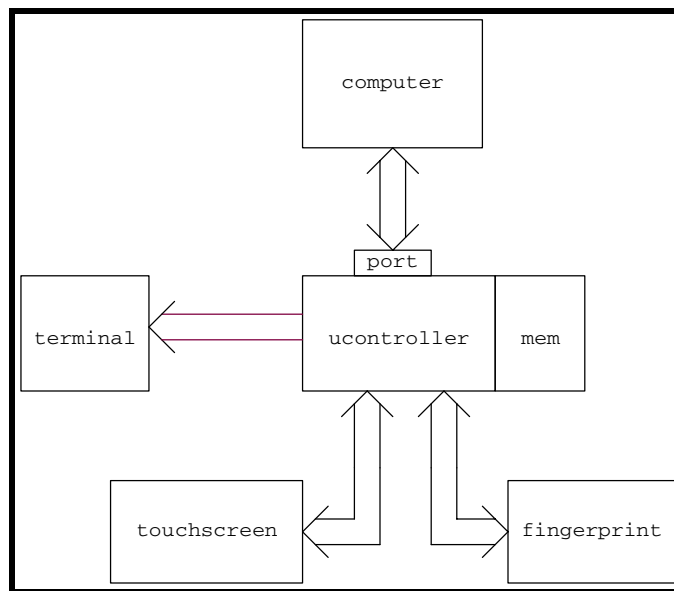
Microcontroller: This section will be the "brains" of the operation. It will take care of the interfacing of the other parts of the system. Furthermore, it will take care of the addressing of necessary information about our clients to memory.

Touch Screen: This is the screen that the client will be using to complete his/her purchase. After scanning his/her fingerprint, the system will present payment options to the client on this touch screen. These options will be located in a database in memory. The client will then touch his/her choice method of payment. After choosing the method of payment, the purchase will be complete.

Fingerprint Scanner: This biometric system will scan the user’s fingerprint and identify them on a one-to-many basis. The user’s fingerprint will be on the database of the system from when the customer previously signed up for the service. The security of this method of identification is similar to the security of a 65 character keyboard typed password. After identifying the customer the necessary information will be displayed to the clerk and customer.

Computer Port: This section will be used to enter client information into the system. Furthermore, it will be used to update the database so that client database information can be shared on a company wide basis.

The following diagram below is an outline of our system and its main sections.



[Figure 1] – Block Diagram of Biometric Point of Sale System

IV. COMPONENTS LIST

The following is a simple list of main parts that will be used and their estimated costs. Each main part will indeed require other components, but these are still under research at this time.

- AT89C55 Microcontroller \$7.00
- Touch Screen Module \$300.00
- Fingerprint Scanner \$200.00
- Computer Monitor \$00.00
- Computer \$00.00
- Memory \$15.00
- Miscellaneous Components \$75.00

-- Perforated board, sockets, wire, etc.

V. TIME SCHEDULE

The following is an estimate of the different phases of our thesis and how long we estimate that it will take to complete them.

Tasks	January				February				March				April				May			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Research																				
Parts Ordering																				
Hardware Design																				
Software Design																				
Hardware																				
Construction																				
Software Testing																				
Final Tested																				



[Fig 2] Timeline for Thesis Completion

VI. ACCEPTANCE TESTING

The following is a checklist of the items that will be demonstrated to the CEEN faculty to show that our system meets the objectives that we have stated in this proposal.

1. Scan fingerprint of user – will show that the system properly identifies the user.
2. Account information will be presented to the user on the touch screen.
3. User and purchase information will be presented to the clerk on the monitor.
4. User will select payment method – this will complete sale.
5. New users will be entered into the system.
 - Will be able to enter new user’s payment options into system from a computer via a serial update port.
 - Scan new user’s fingerprint into system
6. Update system database via update port.

VII. TEAM MEMBERS

Bailey, Rich

Connor, Brian

Dissinger, Bryan

VIII. ASSIGNMENTS OF EACH MEMBER

This section will outline the responsibilities of each team member. The team members have similar strengths when it comes to what is needed to complete the senior

thesis. However, for the thesis to be completed successfully, it is understood that there must be some division of work. Therefore, the following is a general outline of what each team member will be focusing on.

Microcontroller Integration – Rich Bailey

Fingerprint Integration – Brian Connor

Touch Screen Integration – Bryan Dissinger

Port Communication and Updates / Terminal– Brian Connor

External Memory – Rich Bailey

Database – Bryan Dissinger

VIX. SUMMARY

This section will briefly review what our thesis will do when completed. The following will be a step-by-step list of how the process will work.

4. The customer (user) will be entered into the systems database.
 - The user's fingerprint will be scanned into the system.
 - The user's requested payment account information will be entered.
 - The user's age will be entered into the system for age identification purposes.
5. The customer will then request to complete a purchase
 - He/she will begin by scanning his/her fingerprint.
 - The system will positively identify them.

- The user's information (age, name, etc) will be presented to the clerk at the terminal.
- The touch screen will display the user account information and payment options.
- The user will select his/her method of payment and the purchase will then be completed.

6. Database Update

- The database will be updateable via computer through the update port.
- The newly entered user accounts will then be able to function properly.