IMPLEMENTATION OF BIOMETRIC PAYMENT TECHNOLOGY IN ORGANIZATIONS

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ABSTRACT

Biometric payment technology has become a mature technology and can actually support applications in the real world. However, few organizations have embraced this technology. In this study, a pivotal survey was conducted to investigate into the reasons why organizations resist the adoption of this technology. Preliminary results provide some useful information to help organizations assess the feasibility of incorporating this technology into the framework of their enterprise-wide information systems.

INTRODUCTION

Payment processing has long been the weakest link in the transaction processing cycle of a typical online business. Despite the advancement in technologies for e-commerce applications, payment related activities have been the sources of major breach and security concerns. As fraud continues to increase every year, many financial institutions are looking for possible solutions to this problem. Among those new technologies for dealing with payment processing, biometric payment technology has recently attracted more and more attention as a viable solution to decrease identity theft (Swann, 2004).

Although, the technology has become mature and can actually support applications in the real world, not all organizations have implemented the newly invented biometric payment technology to their organization. Why wouldn’t an organization incorporate this technology in their business that could save that company thousands of dollars every year, especially in the United States – a country full of convenient technologies and services? In this study, a study will be conducted to investigate into reasons why some organizations are still hesitant to incorporate this system into their everyday lives.

To answer the above-described question, details of this new technology and which businesses have already utilized this system will be first discussed. The focus will then be shifted to problems dealing with this new technology and come up with the best method to research this problem. Some plausible solutions to solve this problem and how to convince biometric companies to implement this technology to all the businesses around the world will then be presented. A summary of major findings in this study together with a discussion on directions for further study will conclude this paper.

BACKGROUND INFORMATION ABOUT THE TECHNOLOGY
Biometric systems may be defined as the “automated methods of verifying or recognizing a living person on the basis of some physiological characteristics, such as fingerprint or iris patterns, or some aspects of behavior, such as handwriting or keystroke patterns (Jamieson and Stephens, 2007).” There are two types of biometric technology, namely physiological and behavioral biometric technology. Physiological biometrics involves physical characteristics such as facial features and fingerprint, eye, and hand patterns. Behavioral biometrics recognizes the voice and signature patterns. In this study, the focus is on the physiological biometrics which involves the fingerprint as a method of payment for the items purchased in the store.

Biometric technology has been around for a very long time, mostly used in high security places such as the police department and the government. As people get more comfortable with this new technology, there will be more people who are willing to accept biometric payment technology as part of their world of convenience (Kuykendall, 2004). According to Biometric Group, a New York research company, biometric payment companies processed $33.8 million of revenues in 2004 and estimates by 2008 that it will grow to $243 million (Cuneo, 2004).

Biometric payment technology eliminates the need to carry around cash, checks, credit cards, etc (Down, 2005). It is so far the most cost effective biometric method. Iris scanning is expensive and voice technology might not work in noisy stores or if that person has a cold (Halpherin, 2006). All the customers would have to do is scan their fingerprint at the point-of-sale and the transaction is finished. The enrollment process involves only a couple of minutes of the customer’s time. All they have to do is scan their fingerprint, enter a pin number or code, and enter the credit and debit card information (Down, 2005). The system then transforms points of the fingerprint into a mathematical formula so the full image of the fingerprint is not actually stored in the system preventing hackers from stealing the fingerprint. And when the customer visits the supermarket and wishes to use the biometric payment to complete their transaction, they just have to scan their fingerprint, enter their code number and choose which debit or credit card they want to use and the transaction is complete after a matter of a few seconds (Maney, 2003).

Some advantages to this new technology for users are ease of use, convenience, and it also helps prevent identity theft by not carrying around credit cards or worst losing a credit card. College students are most likely to try this new technology first because they are curious of new devices (Embrey, 2003). Pay by Touch, a biometric payment company, states the biggest advantage to their system is the quickness in speed at the checkout lanes (McCarthy, 2005).

Advantages for the merchants are reduction in processing fees for the company and a reduction in charge-backs from the customers (Cuneo, 2004). They also can keep track of their loyal customers using the biometric payment system so they can mail coupons and discounts to their faithful customers (Gentry, 2007). Others use biometrics for identification purposes when customers are cashing in their paychecks. This decreases the amount of fraudulent checks for the merchant (McCarthy, 2005). Acquiring the biometric technology is relatively inexpensive, according to Pay by Touch’s Vice President Jon Siegel, the device can be purchased for less than $30 (Pay by Touch, 2006).
Another benefit for the merchant and the consumer when using the biometric payment option is age-restricted items are automatically cleared because the information about the legal age consumer is already in the system and the user does not have to show identification to purchase those products (Embrey, 2003). Biometric payment technology protects the purchaser by not handing over personal sensitive information to the cashiers (Hopkins, 2005). Shown below is a process the biometric system goes through in order to identify and validate the current person using the technology.

**PROCESS OF ENROLLING AND IDENTIFYING THE USER OF THE BIOMETRIC SYSTEM**

The biometric companies must research why some merchants are hesitant from implementing this cost-saving and convenient system in their business. A similar problem to this hesitation is the introduction of the credit cards back in the 1960s. They were not actually fully accepted by the public until a decade later (Cuneo, 2004). The biggest problem that biometric companies have to face is the privacy issues. Some feel uncomfortable letting a system take their fingerprint because they fear that it will be tracked by the government or law enforcement (Embrey, 2003). Others feel that even though the fingerprint is encrypted, computer hackers will find a way to decrypt the fingerprint into the actual print (Ananthaswmy, 2007).

Another problem with the biometric payment technology is valid customers could be denied access to their financial information if their fingerprint is affected by a bad cut, chemical solutions, or even dirt on their finger like construction workers (Down, 2005 and Halperin, 2005). Shown below is an example of a damaged finger.

One of the ways to ease customer’s concerns about biometric technology is to conduct a focus group to discuss the benefits and pitfalls of this system. The benefit of a focus group is to obtain information from real people and gather ideas on what could be done to get the public to be comfortable with this new technology. They also might be able to provide some valuable suggestions that biometric companies have not thought of. In order for biometric payment companies to be more accepted in the community, according to the article “Everything’s Changing,” “education will help customers adapt to new tools and make the transition as easy as possible” An example of a technology that was successful at this was the introduction of the barcode, now business life is unimaginable without it (Mullin, 2006).

**EXAMPLES OF BIOMETRIC PAYMENT TECHNOLOGY IN USE**

The largest biometric payment company, Pay by Touch, has recently announced that after acquiring competitor BioPay for $82 million, they have 2.3 million enrolled customers in their system (Clark, 2006 and Pay by Touch, 2006). Biometric payment technology can be found at available supermarkets, fast food restaurants, gas stations, and at some hotels that has installed their technology in their business (Down, 2005). Supermarkets such as Piggly Wiggly Carolina Co. and Lowes Foods recently expanded the biometric technology to all of their stores in North Carolina, Virginia, South Carolina, and Georgia after a successful trial run on a few of their stores (Duff, 2006 and Lowes, 2005).
Supermarkets such as Midcountries Co-operative in the United Kingdom saw an ad on a biometric payment company and decided to fly COO Bill Laird to the United States to check out this new system. He was very impressed and implemented the technology to all his supermarkets (Anonymous, 2006). Even major financial industries overseas have already used this technology as a matter of convenience and competitive advantage for their currently customers such as Citibank, Singapore and Discover Financial Services (Citibank, 2007 and Kuykendall, 2004). These examples, however, represent only a small fraction of the markets in which the biometric payment technology can help. So, why a majority of the organizations still resist this seemingly win-win technology? To help shed the light to better understand the reasons of resisting to adopt this technology by those organizations, a pivotal survey study was conducted.

**RESEARCH METHODOLOGY**

The method used to conduct this study is a survey that consists of five questions to gather data for the preliminary study. Besides the first and last question, the survey has four choices for the respondent to pick from including a choice to pick from where they can put another suggestion not shown as one of their choices. A survey was chosen as the best research methodology for this topic because it gets the opinions from the potential customers on some reasons of why people use the system or why they would not use the system. Fifty randomly selected business management people with reasonable knowledge about the biometric system were asked to fill out this survey. Shown below is the series of questions that were requested from the population.

The first three questions that are asked is if the respondent would actually use the technology if it was available for the organization to consider. The purpose of these questions is to gather the reasons why that particular person would utilize or not utilize this technology. Then the question proceeds to the second or third question depending on their answer to the first question. The intention of the fourth question is where users would most want to use this convenient technology. This will help to gain some ground on where the system would most be utilized and what type of businesses the biometric companies can start advertising their system to. The purpose of the last question is to provide some suggested solutions that biometric companies can do to convince more people to consider this new technology and be comfortable with utilizing it. This question is the most valuable of the five questions because it gives us a solution from the eyes of the user. Then after the data has been collected, we will transform the information into bar charts and pie charts.

**RESULTS SUMMARY**

Initial results of data collected from these fifty participants were tabulated and converted to a variety of charts as reported below. About 66% of the people that were surveyed would use the biometric technology if it were available in the area. As a result, there is a huge missed opportunity for the biometric payment companies to implement their system in businesses in Mississippi because currently there are none in Mississippi. Only 33% reported that they would not use biometric systems as a payment option. In this report, special emphasis will be put on the 33% of the people who answered no to this question and try to come up with a solution to this problem.
This bar chart illustrated above shows the reasons why the respondents would not use the biometric systems. Out of 33% of the people who answered no to the question, half of them feel that their identity will be stolen and the other half feels that it is an invasion of privacy. This tells us that these are the people who are not all that comfortable with new technology especially when dealing with sensitive information. It can be reasonably assumed that the respondent’s reasoning is possibly due to pass experiences with identity theft or an invasion of privacy. Later on in the report, solutions to this problem to increase the number of potential users for this technology will be proposed.

Shown below is a pie chart asking the respondents what the reason they want to try out the technology. Half of them said they would use it for the convenience and the other half states it would decrease their chances of identity theft because they would not have to carry around their credit or debit cards. They also would not have to worry about losing the credit card as well. It would be one less thing for the user to carry around in their purse or wallet, which a decreased chance of identity theft and a convenience for the end user.

Illustrated below is a bar chart that answered the question of where the people would mostly likely want to use the technology as an option of payment. Most of them want to see the device at a supermarket versus the other places like major retail stores and clothing stores. This result is very surprising because usually customer have to wait the longest at a major retail store. In my personal opinion, I would most likely use this technology at a major retail store such as Wal-Mart or Target. Only 33% of the respondents said they would use this technology at a major retail store and only 16% said they want to use it at clothing stores.

The last question is an opinion from the respondent asking what they would suggest a biometric payment companies do to convince people to give this technology a try. This will give the biometric companies an idea of what type of business they can gear their systems toward so it can be most utilized until people cannot imagine life without this convenient technology. Here are some of the suggestions:

- Have a money back guarantee if identity is stolen
- Provide strong information that their data is secured and “theft proof”
- Demonstrate at tradeshows and seminars
- Advertise technology at major retail stores
- Offer special discounts for enrolling in the system

Most people suggest that the companies must educate the public on how it works and show the data is secured in the system. Some people said they would like it demonstrated to them to see how easy it is at tradeshows or in retail stores.

**MANAGEMENT IMPLICATION**

Over thousands of cases of fraud are reported every year; no wonder customers are hesitant to try biometric payment systems. The goal is how to get customers to be comfortable using this technology. By accomplishing that goal, the customers would first have to enroll in the system. After gathering all the results, the conclusion that people want more information first before they will enroll in the biometric payment system can now be derived. Customers want to be
comfortable and confident using a new technology especially if it is dealing with their personal finances. Customers are always looking for ways to save on products and services.

One of the plausible suggestions would be to advertise a special discount for enrolling in the system. Then once the customer enrolls in the system, the intention is for the customers to use the biometric payment system as a method of payment. Customer would then realize that it is very easy and convenient and use the system every time they come into the store. Another suggestion is to offer a money back guarantee for any fraudulent charges made in the biometric system so it would insure the customer for any charges that they did not make. This is similar to the FDIC, it is an insurance policy banks use to insure all the customers’ money up to $100,000. I would also suggest having available technical support personnel in every business in case the customers have any questions or concerns about the system.

CONCLUDING REMARKS

In this report, the basic information about biometric technology from the definition of biometric and the types of biometrics has been discussed. It has been found that currently biometric payments are being utilized in supermarkets in the Northeast states.

A survey was conducted to get a better picture of why some choose to use this system and why others are hesitant to enroll in it. It was found that the ones who would not use this system is concern about identity theft, while others feel that it is an invasion of privacy. The people who would use this system said they would use it out of convenience and it would decrease identity theft for them personally. They would not have to worry about losing their credit card or worse having the credit cards stolen. This study also found that future customers would most likely use this technology in a supermarket. This information should inform the biometric companies that they should start their systems in all supermarkets before they enter into another market.

In order for the public to better accept this technology, biometric companies would have to educate the public so they would be more comfortable sharing their financial information with the companies. This includes, but not limited to, advertisement on their websites and/or television. A suggestion that may encourage the implementation of the biometric technology is to offer special discounts to entice already curious people to enroll in the system. This suggestion would lead into future researchers to see if this suggestion worked for the businesses in the future. No matter if people are comfortable with this new technology, it is slowly being implemented all around the United States. It is up to the biometric company to gets the customers to quickly accept this technology as part of our everyday lives of convenience.

Results derived from the pivotal survey conducted for this study are preliminary. The survey form will be further expanded to include more technical questions and more in-depth management related questions. Survey will also be extended to contact more information management professionals to make the results of sampling analyses more useful. All these will be done and the results reported in our future studies.

(Figures, tables, and references are available from the first author)