Implementing a Software Switch and a Mobile Application to Prevent Frauds and Control the Usage of Electronic Transactions

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Declaration

I confirm that this thesis is a presentation of my original research work for the degree of M.Sc. in Information Technology. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions.

The work was done under the guidance of Mr. B. H. Sudantha, at the Faculty of Information Technology, University of Moratuwa, Sri Lanka.

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In my capacity as supervisor of the candidate's thesis, I certify that the above statements are true to the best of my knowledge.

Mr. B. H. Sudantha

Date:

Acknowledgement

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G T C Liyanage

Dedicated

To Mr. B. H. Sudantha

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To My Wife and Parents

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To those who lost their valuable money
Because of they had no control over their plastic card

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Glossary of Terms

API	Application Programming Interface
ASCII	American Standard Code for Information Interchange
ATM	Automated Teller Machine
CRUD	Create, Read, Update, Delete
DDC	DieBold® Direct Connect
DSS	Data Security Standard
FOS	Free and Open Source
GPL	General Public License
ISO	International Standards Organization
MD5	Message digests - 5
NDC	NCR® Direct Connect
PCI	Payment Cards Industry
POS	Point of Sales
SHA	Secure Hash Algorithm
SOAP	Simple Object Access Protocol
SQL	Structured Query Language
WCF	Windows Communication Foundation
XFS	eXtensions for Financial Services

Abstract

The growth of the electronic payment methods have rapidly increased in past decades. This has been resulted in growth in electronic transactions fraud. The main source of electronic transactions is card payments. People are reluctant to do card payments online because they think twice about the security. On the other hand if a person loses his card or identity of any electronic payment system, he/she has a higher chance of losing their money. ePaySwitch is less complicated but reliable method of preventing a card fraud which gives the control of the card to the user.

ePaySwitch gives the control of the card to the end customer through the mobile application. ePaySwitch server is installed on premises of the bank or financial institute. Server has two main sub modules as 'Payments Processor' and the 'Customer and Cards Manager' which implemented on two separate servers. These two modules are connected to the database which runs on a separate server. Combination above two modules with database and mobile application together, we call the ePaySwitch.

Customer can keep their cards turned on or off using the mobile application. They even can set whether can perform transactions Online, Offline or for Withdrawal. Additionally they have the facility to set maximum transaction values for each of the above transaction types. This feature enables the customers to protect their money even their cards have lost or stolen.

Mobile application communicates with the server via APIs bind to the mobile application. These APIs are written Java and hosted on an Apache Tomcat server. Payments Processor and the Customers and Cards Manager have written in PHP and hosted on an Apache web server. Database is a MySql GPL version for the current version of ePaySwitch.

Simulation shows how the system will work on real environment. Answers to the questionnaire we prepared shows that some customers' biggest paint point is fear of losing their money because of cards. Some have showed that they have no idea on their spending when using the cards. But somehow they are willing to user a solution like ePaySwitch if they had a chance.

Finally it is shown that ePaySwitch is a practical solution for prevent frauds and control transactions in the electronic environment.