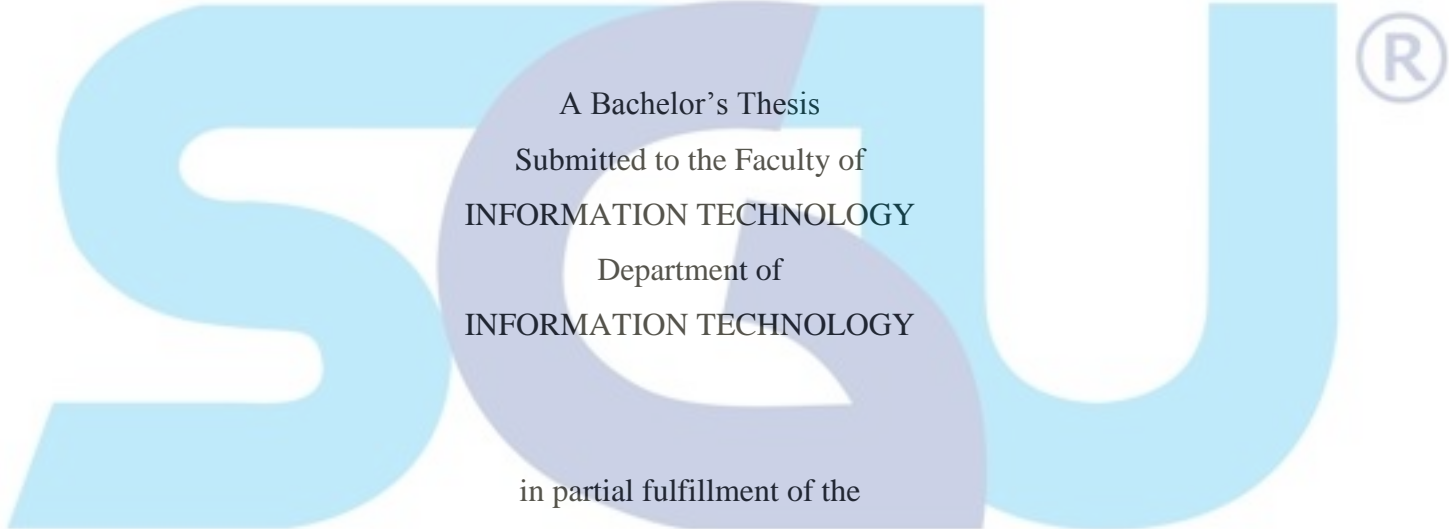


ENHANCE EXISTING E-KTP CHIP CARD
TO SUPPORT MICRO-PAYMENT FEATURE

**ENHANCE EXISTING E-KTP CHIP CARD TO SUPPORT MICRO-PAYMENT
FEATURE**

By
Adrian Putra Taslim

The logo of Swiss German University (SGU) is a large, stylized 'SGU' in light blue. The 'S' and 'G' are connected, and the 'U' is a simple block letter. A registered trademark symbol (®) is located to the right of the 'U'.

A Bachelor's Thesis
Submitted to the Faculty of
INFORMATION TECHNOLOGY
Department of
INFORMATION TECHNOLOGY

in partial fulfillment of the
requirements for the Degree of

BACHELOR OF SCIENCES
WITH A MAJOR IN INFORMATION TECHNOLOGY

The text 'SWISS GERMAN UNIVERSITY' is written in a large, bold, light blue font across the bottom of the page, serving as a watermark.

SWISS GERMAN UNIVERSITY

EduTown BSD City

Tangerang – 15339

Island of Java, Indonesia

www.sgu.ac.id

September 2011

Adrian Putra Taslim

STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, not material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

Adrian Putra Taslim

Date

Approved by:

James Purnama, M.Sc.

Date

SWISS GERMAN UNIVERSITY

Dwidharma Priyasta, B. Eng, M. Sc

Date

Chairman of the Examination Steering Committee

Date

Adrian Putra Taslim

ABSTRACT

**ENHANCE EXISTING E-KTP CHIP CARD TO SUPPORT
MICRO-PAYMENT FEATURE**

By

Adrian Putra Taslim

SWISS GERMAN UNIVERSITY

Bumi Serpong Damai

James Purnama, M. Sc. , Major Lecturer

The usage of micro-payment cards have been increasing worldwide. The same condition also happens in Indonesia. It can be seen from the number of customer who have Flazz BCA, Mandiri e-toll card that keep increasing by the matter of time. And not so far from now, Indonesia government will implement a new citizen identity system that using a contactless, chip-based smart card. This system has a lot of good prospect, and one of them is by implementing a micro-payment feature into one of its feature. The card itself still has some free space that can be used for another application that is separated from the e-KTP main feature itself.

To implement a micro-payment feature, the data structure should be changed so the new application can store needed information and also gathered needed information effectively. Therefore, a new data structure will be proposed and also a simple application to demonstrate the micro-payment feature will be created.

In summary, it is possible to enhance the e-KTP card to support the micro-payment feature. But the data structure inside the card should be changed into the proposed one, so that the application will not interfere other application and the data flow will be more effective.

Keywords—e-Government, e-KTP, Smart Card, Contactless Card, Data Structure, Micro Payment, e-Commerce

DEDICATION

I dedicate this thesis to my family, my relatives, and my friends.



ACKNOWLEDGMENTS

The author wishes to give gratitude to Jesus Christ, because of His blessings and guidance had helped the author to complete this thesis.

The author would also give special thanks to James Purnama, Dwidharma, and Dr. Eng for acting as my thesis advisors. They have had given the author supports, suggestions and guidance in completing this thesis.

In addition, the author would also like to give thanks to BPPT for giving time and place to the author so this thesis can be completed.

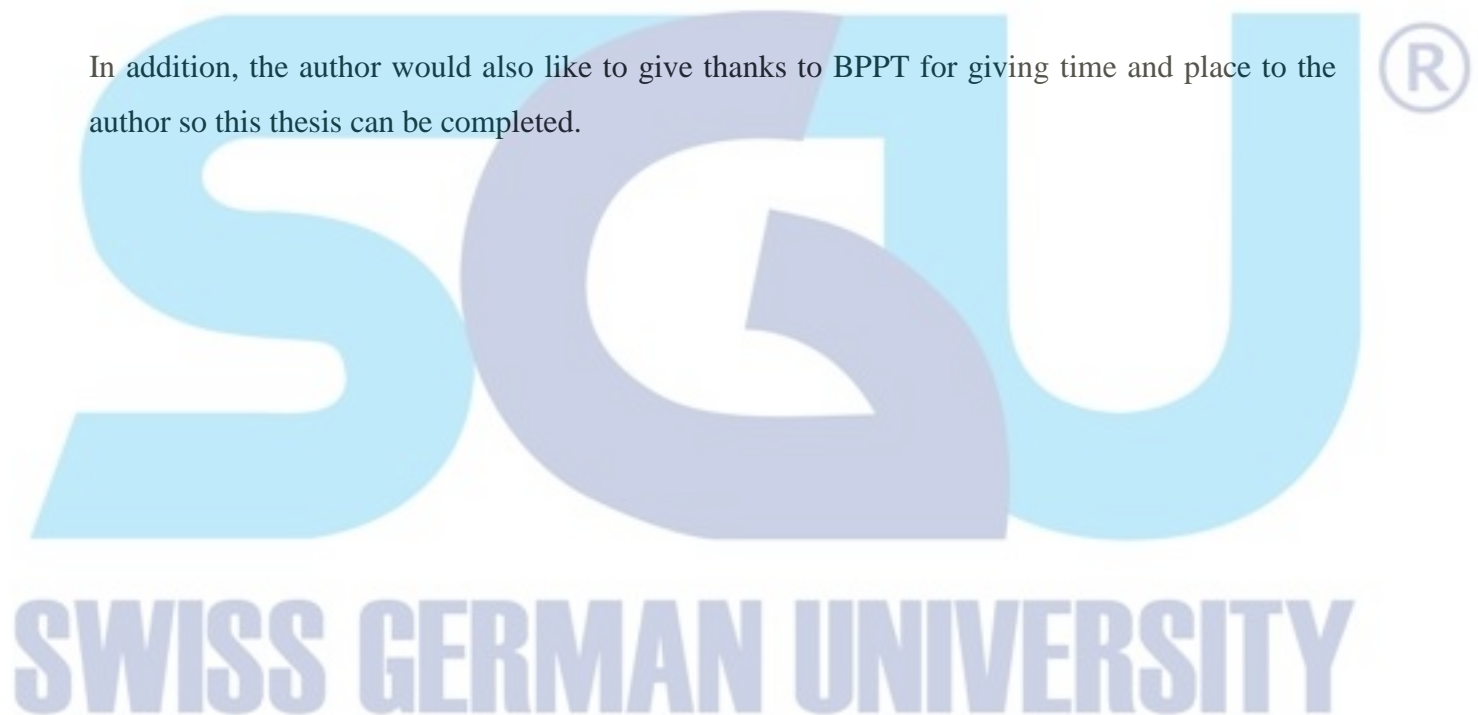


TABLE OF CONTENTS

STATEMENT BY THE AUTHOR.....	2
ABSTRACT	3
DEDICATION	4
ACKNOWLEDGMENTS	5
TABLE OF CONTENTS.....	6
LIST OF TABLES.....	9
LIST OF FIGURES	10
CHAPTER 1 – INTRODUCTION.....	13
1.1 Background	13
1.2 Research Problem.....	13
1.3 Research Objective.....	13
1.4 Scope of Analysis.....	14
1.5 Research Limitation	14
1.6 Research Contribution.....	14
1.7 Methodology	14
CHAPTER 2 – LITERATURE REVIEW.....	16
2.1 Indonesian Electronic ID Program (e-KTP).....	16
2.1.1 Nomor Induk Kependudukan (NIK)	16
2.1.2 E-KTP Regulation	17
2.1.3 E-KTP Planned Workflow 2011	17
2.2 Smart Card.....	18
2.2.1 Memory Cards.....	19
2.2.2 Microprocessor Cards.....	20
2.2.3 Contactless Smart Cards.....	21
2.3 Smart Card in e-KTP Project	23
2.3.1 ISO/IEC 7816.....	25
2.3.2 ISO/IEC 14443.....	25
2.3.3 ICAO 9303	25
2.4 BasicCard.....	26

2.4.1	BasicCard Versions	27
2.4.2	BasicCard Algorithms and Protocols	28
2.5	Challenge-Response Authentication Protocol.....	29
2.6	Black Box Testing	30
CHAPTER 3 – METHODOLOGY		31
3.1	Hardware Benchmarking.....	31
3.2	Analyzing Business Process.....	32
3.2.1	Whole Business Process	35
3.2.2	Research Scope.....	38
3.3	Designing Data Structure	39
3.4	Designing Database.....	43
3.5	Prototyping	45
3.5.1	Back-end Prototype (Register Card)	45
3.5.2	Front-end Prototype (Top-up and Payment)	50
3.6	Results Analysis and Documentation.....	61
CHAPTER 4 – RESULT AND ANALYSIS		63
4.1	Prototype Testing	63
4.1.1	Prototype Assumptions.....	63
4.1.2	Prototype Limitations	63
4.1.3	Prototype Testing Scenarios.....	64
4.1.3.1	Back-end Testing	64
4.1.3.2	Front-end Testing	69
4.2	Prototype Features and Screenshots.....	75
4.2.1	Back-End Prototype	75
4.2.1.1	Main Page	75
4.2.1.2	Login page	77
4.2.2	Front-End Prototype	79
4.2.2.1	Main Page	79
4.2.2.2	Change Merchant Name	83

4.2.2.3	Top-Up.....	84
4.2.2.4	Making Payments	86
4.2.2.5	See History	88
CHAPTER 5 – CONCLUSION AND FUTURE WORKS		90
5.1	Conclusion.....	90
5.2	Future Works.....	90
GLOSSARY		92
REFERENCES		92
APPENDICES		94
APPENDIX A – Card Codes		94
	Card.def	94
	Card.bas	95
APPENDIX B – Back-End Application Codes		102
	Program.cs	102
	MicroPayment.cs	102
	Register.cs	106
	Login.cs	111
APPENDIX C – Front-End Codes.....		114
	eKTP.cs	114
	About.cs	114
	MerchantName.cs	114
	Payment.cs	116
	History.cs	121
	MicroPayment.cs	123
CURRICULUM VITAE.....		129