

**INFORMATION SYSTEM DEVELOPMENT USING
SYSTEM DEVELOPMENT LIFE-CYCLE IN TB. PANJI JAYA**

A THESIS

**Submitted in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Engineering in Industrial Engineering**



MELIA PUTRI HANDAYANI

14 14 07822

**INTERNATIONAL INDUSTRIAL ENGINEERING PROGRAM
DEPARTMENT OF INDUSTRIAL ENGINEERING
FACULTY OF INDUSTRIAL TECHNOLOGY
UNIVERSITAS ATMA JAYA YOGYAKARTA**

2018

**INFORMATION SYSTEM DEVELOPMENT USING
SYSTEM DEVELOPMENT LIFE-CYCLE IN TB. PANJI JAYA**

A THESIS

**Submitted in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Engineering in Industrial Engineering**



MELIA PUTRI HANDAYANI

14 14 07822

**INTERNATIONAL INDUSTRIAL ENGINEERING PROGRAM
DEPARTMENT OF INDUSTRIAL ENGINEERING
FACULTY OF INDUSTRIAL TECHNOLOGY
UNIVERSITAS ATMA JAYA YOGYAKARTA
2018**

IDENTIFICATION PAGE

A THESIS ON
**INFORMATION SYSTEM DEVELOPMENT USING
SYSTEM DEVELOPMENT LIFE-CYCLE IN TB. PANJI JAYA**

Submitted by
Melia Putri Handayani
14 14 07822

Was examined and approved on June 27th, 2018

Faculty Supervisor,



Ririn Diar Astanti, S.T., M.MT., D.Eng.


Co- Faculty Supervisor,



Kristanto Agung Nugroho, S.T., M.Sc.

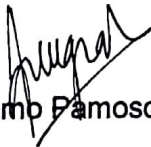
Board of Examiners,

Chair,



Ririn Diar Astanti, S.T., M.MT., Dr.Eng.

Member,



Anugrah Kusumo Pamosoaji, S.T., M.T.

Member,



V. Ariyono, S.T., M.T.

Yogyakarta, June 27th, 2018

Universitas Atma Jaya Yogyakarta,

Faculty of Industrial Technology,



Dean,



Dr. A. Teguh Siswanto, M.Sc.

DECLARATION OF ORIGINALITY OF RESEARCH

I certify that the research entitled "Information System Development Using System Development Life Cycle in TB. Panji Jaya" in this thesis has not already been submitted for any other degree.

I certify that to the best of my knowledge and belief, this thesis which I wrote does not contain the works of parts of the works of other people, except those cited in the quotations and bibliography, as a scientific paper should.

In addition, I certify that I understand and abide the rule stated by the Ministry of Education and Culture of The Republic of Indonesia, subject to the provisions of Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 17 Tahun 2010 tentang Pencegahan dan Penanggulangan Plagiat di Perguruan Tinggi.

Signature



Student name : Melia Putri Handayani

Student ID : 14 14 07822

Date : June 27th, 2018

ACKNOWLEDGEMENTS

The completion of this thesis entitled “*Information System Development Using System Development Life-Cycle in TB. Panji Jaya*” marked the final accomplishment of my study period as an International Industrial Engineering student in Faculty of Industrial Technology, Universitas Atma Jaya Yogyakarta. I would like to express my gratitude to God for all the blessings and also to my parents for always giving me all advices and motivations until this day.

There are some people who also giving me such presence that support all the process of conducting the research in this thesis. I sincerely thanks to:

1. Mr. Dr. A. Teguh Siswanto, M.Sc., as the Dean of Faculty of Industrial Technology, Universitas Atma Jaya Yogyakarta.
2. Mrs. Ririn Diar Astanti, S.T., M.MT., D. Eng., as Head of Industrial Engineering Department, faculty supervisor, and academic supervisor.
3. Mr. Kristanto Agung Nugroho, S.T., M.Sc., as co-faculty supervisor.
4. Mr. V. Ariyono, S.T., M.T. and Mr. Anugrah Kusumo Pamosoaji, S.T., M.T. as thesis examiner.
5. Mr. Brilianta Budi Nugraha, S.T., M.T., as Head of *Elektronika Industri* Laboratory.
6. Mrs. Bening Parwitasukci, as Final Proposal Writing supervisor.
7. Toko Besi Panji Jaya, as the object of my research.
8. My family, Papa and Mama, Yuda, Farel, Vico, Emak, Kuku Lingling, Nadia, Jerry, Jingga, Ko Daniel, Cik Lala, Ko Wen le, Jojo, Kuku Cien, Ko Panji, Cik Tata, and all of the family members, Jong and Tan Family.
9. Assistant Lecturer of PST 3 Even Semester 2017/2018, Hengki, Eric, Ferry, Kak Kristo, Ely, Irma, Wanda, Valent, Jeffry, and Reyno.
10. TI and TIKI 2014 family, Rico, Nicho, Freddy, Tina, Vincent, Sherly, Chichi, and all member of Industrial Friendship 2014.
11. Selikur and Van Lith family, Vanni, Yulina, Tejo, Stella, Disty, Clara, Depang, Eva, Sintia, Dwina, Tata, Tien, Via, Julio, Milka, Mira, Nanda, Bli Nando, Gibon, Sebi, and Vena.
12. Espeelsa family, Dinda, Krisan, and Gitta.

I hope this research can be useful for others, especially for TB. Panji Jaya and I am glad to receive any suggestions and critics to improve this kind of research.

DEDICATIONS

Matthew 25:20

“And he who had received the five talents came forward, bringing five talents more, saying, ‘Master, you delivered to me five talents; here, I have made five talents more’.”

This thesis entitled “Information System Development Life-Cycle in TB. Panji Jaya” was originally made as my dedication to my parents, the owner of TB. Panji Jaya who have been the best of the best ‘support system’ I have ever had in my life. There is nothing I can do to give any payback for all of their efforts to make me who I am now. For the last 18 years of my life, they have been struggling a lot to provide me with the very best education at the best school in my hometown. Graduated from Pangudi Luhur Kindergarten, Elementary School, Junior High School, and Senior High School, then have the chance to pursue the bachelor degree study at the International Class of Industrial Engineering, Universitas Atma Jaya Yogyakarta, it is all my parents’ support. For life, I have always been that person who always wanted to be a good example for everyone who sees me and know me personally. And now, as the first-born in my family, I am levelling up as the oldest sister of Yuda, Farel, Vico, and all of my cousins and relatives. All of my efforts to study hard and get good qualifications as a bachelor is all for giving back what my parents have given to me, because that is all I can do, to make them proud parents, and make the whole family proud of me.

My dedication also goes to Mrs. Ririn Diar Astanti, S.T., M.MT., Dr.Eng., as Head of Industrial Engineering Department, Coordinator of International Industrial Engineering, my final project supervisor (faculty supervisor), my academic supervisor for the whole study period, and my mentor for university life for every motivation, support, care, and hope to me for the last 4 years. Thank you for acted out not only as a lecturer but also as ‘my parents in school’ together with Mr. The Jin Ai, Dr. Eng. Thank you for all the chances, experiences, advice, suggestions, and cares you have given to me.

I always believe in that bible quote, about what a human should do when God giving you the certain ability, skill, and talent. And thanks to those who have given me that ability to share many more talents to anyone around me. All dedications are for you.

Yogyakarta, July 14th, 2018

Respectfully yours with sincere gratitude,

MELIA

TABLE OF CONTENT

CHAPTER	TITLE	PAGE
	Title Page	i
	Identification Page	ii
	Declaration of Originality	iii
	Acknowledgement	iv
	Dedications	v
	Table of Content	vi
	List of Table	viii
	List of Figure	ix
	List of Appendix	xi
1	INTRODUCTION	
	1.1. Research Background	1
	1.2. Problem Formulation	4
	1.3. Objectives of Research	4
	1.4. Scope and Limitation	4
2	THEORETICAL BACKGROUND	
	2.1. Literature Review	5
	2.2. Theoretical Background	9
3	RESEARCH METHODOLOGY	
	3.1. Preliminary Research Phase	21
	3.2. Analysis Phase	22
	3.3. Design Phase	23
	3.4. Implementation and Installation Phase	24

4	ANALYSIS PHASE	
	4.1. Business Process Identification	26
	4.2. Evaluation of the Current Business Process	34
	4.3. Proposed Business Process	38
5	DESIGN PHASE	
	5.1. Data Flow Diagram	45
	5.2. Entity Relationship Diagram	50
	5.3. Database	63
6	IMPLEMENTATION AND INSTALLATION PHASE	
	6.1. Information System Modelling	67
	6.2. Installation	76
7	CONCLUSION AND SUGGESTION	
	7.1. Conclusions	78
	7.2. Suggestions	78
	REFERENCES	79
	APPENDIX	
	Appendix 1. Interview Script 1	84
	Appendix 2. Interview Script 2	88

LIST OF TABLE

	PAGE
Table 2.1. Literature Review	7
Table 4.1. List of Activities for Each Entity	27
Table 4.2. SWOT Analysis	35
Table 4.3. SWOT Strategies	36
Table 5.1. Entity Selection	49
Table 5.2. Attributes of Customer Data	50
Table 5.3. Attributes of Sales Data	50
Table 5.4. Attributes of Product Data	51
Table 5.5. Attributes of Purchase Data	51
Table 5.6. Attributes of Supplier Data	52
Table 5.7. Unnormalized Sales Data	55
Table 5.8. Normalization Result of Sales Data	55
Table 5.9. Unnormalized Purchase Data	58
Table 5.10. Normalization Result of Purchase Data	58
Table 5.11. Database of Product	62
Table 5.12. Database of Supplier	62
Table 5.13. Database of Customer	63
Table 5.14. Database of Purchase	63
Table 5.15. Database of Purchase Detail	64
Table 5.16. Database of Sales	64
Table 5.17. Database of Sales Detail	65

LIST OF FIGURE

	PAGE
Figure 2.1. Steps of Searching Related Journals	5
Figure 2.2. Types of Information System	9
Figure 2.3. SDLC Phases	10
Figure 2.4. System Flowchart Symbols	12
Figure 2.5. 4-quadrant SWOT Analysis Grid	13
Figure 2.6. Data Flow Diagram Symbols (DeMarco & Yourdon)	15
Figure 2.7. Types of Entity Relationship	16
Figure 3.1. Research Methodology Phases	18
Figure 3.2. Preliminary Research Scheme	19.
Figure 3.3. Analysis Scheme	20
Figure 3.4. Design Scheme	21
Figure 3.5. Implementation Scheme	22
Figure 3.6. Installation Scheme	23
Figure 3.7. Evaluation Scheme	24
Figure 4.1. Toko Besi Panji Jaya (Front View)	25
Figure 4.2. Toko Besi Panji Jaya (Inside)	26
Figure 4.3. Business Process of Sales	29
Figure 4.4. Business Process of Purchase	31
Figure 4.5. Creating Sales Invoice	33
Figure 4.6. Sales Invoice	34
Figure 4.7. Purchase Invoice	34
Figure 4.8. Proposed Business Process of Sales	38
Figure 4.9. Proposed Business Process of Purchase	42
Figure 5.1. Contextual Diagram	44

Figure 5.2.	DFD Level 0	46
Figure 5.3.	DFD Level 1	48
Figure 5.4.	Unnormalized Entity Relationship Diagram	53
Figure 5.5.	Normalized Entity Relationship Diagram	61
Figure 6.1.	Microsoft Excel Visual Basic Application Editing Window	66
Figure 6.2.	Main Menu Form	67
Figure 6.3.	Product Input and Edit Form	72
Figure 6.4.	Supplier Input and Edit Form	73
Figure 6.5.	Customer Input and Edit Form	74
Figure 6.6.	Record of Purchase Form	75
Figure 6.7.	Record of Sales Form	77
Figure 6.8.	System Training in TB. Panji Jaya	78
Figure 6.9.	List of Product	79
Figure 6.10.	Sales Invoice	79
Figure 6.11.	Purchase Invoice	79
Figure 6.12.	User Trial in TB. Panji Jaya	79

LIST OF APPENDICES

	PAGE
Appendix 1. Interview Script 1	87
Appendix 2. Interview Script 2	91



Abstract

Information system is essential to provide necessary information in a business. Along with the development of information technology in this era, any kind of business including retail business has no other choice but to follow this development in order to compete with another competitors. Toko Besi Panji Jaya is one of retail business in Yogyakarta that sells building materials. Developing information system in this retailer is the aim of the research. This information system is used to support the decision making process in the retailer. The developed information system is on Management Information System (MIS) level.

The development of information system in Toko Besi Panji followed the System Development Life-Cycle method. The business process was identified by observing the activity in the retailer and interviewed the owner. From the observation and interviews, business process evaluation is done to support the information system development. The evaluation of the business process used SWOT Analysis method. The design phase used Data Flow Diagram and Entity Relationship Diagram as the documentation method on this information system modelling.

By implementing the information system, the retailer can track the records of any transaction happened in the whole business process and the data that is collected in the system is processed to calculate the amount of sales and purchases done in certain period of time. From the result of this process, the owner can make better consideration in decision-making process.

Keywords: *Information system, system development life-cycle, management information system, business process mapping, SWOT analysis*