

CONTENTS

PREFACE.....	I
ACKNOWLEDGEMENTS	II
CONTENTS	III
LIST OF TABLES.....	V
LIST OF FIGURES.....	VI
LIST OF APPENDIX	VII
LIST OF NOTATION AND ABBREVIATION	VIII
ABSTRACT.....	X
INTISARI	XI
CHAPTER 1 INTRODUCTION	1
1.1 Research Background	1
1.2 Research Objectives.....	3
1.3 Research Scope and Constraints	4
CHAPTER 2 LITERATURE REVIEW	5
CHAPTER 3 THEORITICAL BACKGROUND	11
3.1 Electronic-Commerce	11
3.2 City Logistics.....	13
3.3 Last-Mile Delivery.....	14
3.4 Lockers.....	16
3.5 Facility Location Problem	18
3.5.1 P-Median Problem	19
3.5.2 P-Center Problem.....	20
3.5.3 Location Covering Problems	21
3.6 Multi-Objective Particle Swarm Optimization (MOPSO).....	23
3.7 Mutation.....	26
3.7.1 Gaussian Mutation	26
3.7.2 Cauchy Mutation	27
3.7.3 Levy Mutation	27
3.8 Performance Evaluation.....	27
CHAPTER 4 RESEARCH METHOD	30
4.1 Research Object	30
4.2 Required Data	31
4.2.1 Potencial location.....	32
4.2.2 Locker information	33
4.2.3 Demand.....	34
4.3 Research tools	37
CHAPTER 5 RESULT AND DISCUSSION.....	40

5.1 Problem.....	40
5.2 Mathematical formulation.....	42
5.2.1 Notation and Decisions Variable	32
5.2.2 Mathematical Model.....	43
5.3 Improved Multi Objective Particle Swarm Optimization.....	46
5.4 Verification and Validation Model.....	54
5.5 Parameter Setting.....	56
5.6 Experiment Result and Analysis Comparison	58
5.7 Comparison analysis of scenario output	65
CHAPTER 6 CONCLUSIONS AND RECOMMENDATION	79
6.1 Conclusions.....	79
6.2 Recommendation	80
REFERENCES.....	81
APPENDIX.....	89