

CONTENTS

APPROVAL PAGE

SELF DECLARATION AGAINST PLAGIARISM

ABSTRACT iv

ABSTRAK v

ACKNOWLEDGEMENTS vi

PREFACE vii

CONTENTS viii

LIST OF FIGURES xi

LIST OF TABLES xiv

1 INTRODUCTION 1

- 1.1 Background 1
- 1.2 Theoretical Framework 2
- 1.3 Conceptual Framework/Paradigm 3
- 1.4 Statement of the Problem 3
- 1.5 Hypothesis 4
- 1.6 Assumption 4
- 1.7 Scope and Delimitation 5
- 1.8 Importance of the Study 5
- 1.9 Research Plan and Action Point 6

2 BASIC CONCEPT 7

- 2.1 Inventory Management System 7
- 2.2 Blockchain 8
 - 2.2.1 Blockchain Structure 8
 - 2.2.2 Types of Blockchain 9
- 2.3 Hyperledger Fabric 10
 - 2.3.1 Key Components: Peer, Orderer, Channel and Chaincode . . 11

2.3.2	World State Database	13
2.3.3	Mango Query	13
2.3.4	Composite Key	14
3	THE PROPOSED CODES	15
3.1	Preliminary Research	15
3.2	System Model	16
3.2.1	Supply Chain integration in Hyperledger Fabric Topology .	17
3.3	Experimental Setup	18
3.3.1	Experimental Scenario and Limitations	18
3.4	Data Collection Mechanism	19
3.5	Benchmark Scenario	20
4	PERFORMANCE EVALUATIONS	22
4.1	Overview of the Experiment	22
4.2	10,000 Data Experiment: Single-user Environment	23
4.2.1	Single-user 10,000 Data Entries: Execution Time Result and Analysis	24
4.2.2	Single-user 10,000 Data Entries: CPU Usage Result and Analysis	25
4.2.3	Single-user 10,000 Data Entries: Memory Usage Result and Analysis	26
4.2.4	Single-user 10,000 Data Entries Experimental Result and Analysis	27
4.3	50,000 Data Experiment: Single-user Environment	28
4.3.1	Single-user 50,000 Data Entries: Execution Time Result and Analysis	29
4.3.2	Single-user 50,000 Data Entries: CPU Usage Result and Analysis	30
4.3.3	Single-user 50,000 Data Entries: Memory Usage Result and Analysis	31
4.3.4	Single-user 50,000 Data Entries Experimental Result and Analysis	32
4.4	10,000 Data Experiment: Multi-user Environment	33
4.4.1	Multi-User 10,000 Data Entries: Processing Time Result and Analysis	36
4.4.2	Multi-User 10,000 Data Entries: CPU Usage Result and Analysis	37

4.4.3	Multi-User 10,000 Data Entries: Memory Usage Result and Analysis	39
4.4.4	Multi-User 10,000 Data Entries: Experimental Result and Analysis	41
4.5	50,000 Data Experiment: Multi-user Environment	43
4.5.1	Multi-User 50,000 Data Entries: Processing Time Result and Analysis	46
4.5.2	Multi-User 50,000 Data Entries: CPU Usage Result and Analysis	48
4.5.3	Multi-User 50,000 Data Entries: Memory Usage Result and Analysis	49
4.6	Analysis of Memory Usage Fluctuations	52
5	CONCLUSION	53
5.1	Conclusions and Future Works	53
	REFERENCES	54