

CONTENTS

APPROVAL	ii
SELF DECLARATION AGAINST PLAGIARISM	iii
ABSTRACT	iv
ABSTRAK	v
DEDICATION	vi
ACKNOWLEDGMENTS	vii
PREFACE	viii
CONTENTS	ix
LIST OF TABLES	xii
LIST OF FIGURES	xiii
LIST OF TERMS	xv
LIST OF NOTATIONS	xvi
1 INTRODUCTION	1
1.1 Rationale	1
1.2 Theoretical Framework	2
1.3 Conceptual Framework/Paradigm	3
1.4 Statement of the Problem	3
1.5 Objective and Hypotheses	4
1.6 Scope and Delimitation	4
2 REVIEW OF LITERATURE AND STUDIES	6
2.1 Write Blocking function	6
2.2 Storage Protocol	7
2.3 Portability Design	9
2.3.1 Low Coupling	10
2.4 Unified Modelling Language	12
2.5 Significance Test	15
2.5.1 Student t-test	15
2.5.2 Mann-Whitney U	16

2.6	NIST HWB requirements and Test Plan	16
2.7	Contamination in Evidence	19
2.8	NTFS Transaction Journal	20
2.9	Medium Write Protection	21
2.10	Tableau Forensic T35U	22
2.11	Related Studies	22
3	RESEARCH METHODOLOGY	27
3.1	Requirement Analysis	27
3.2	Design	28
3.3	Implementation	32
3.4	Testing Design	35
3.4.1	Coupling Metrics	35
3.4.2	Accuracy Metrics	36
3.4.3	Transfer speed metrics	43
4	PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA	45
4.1	Portability Design	47
4.1.1	Default firmware coupling metrics	47
4.1.2	Low-Coupling Design	49
4.1.3	Coupling Metrics after portability design	51
4.1.4	Portability low coupling design	52
4.2	Prototyping with SDLC	52
4.2.1	Software Requirement Specification	52
4.2.2	Design	53
4.2.3	Implementation	54
4.2.4	Testing results: Accuracy Metrics	56
4.2.5	Performance metrics	61
4.2.6	Proposed HWB vs. Commercial Tableau T35U	64
5	CONCLUSION AND RECOMMENDATIONS	66
5.1	Conclusions	66
5.2	Recommendations	67
	BIBLIOGRAPHY	68
	Appendices	69
A	MISCELLANEOUS	71
A.1	Forensic Preservation Flow	71
A.2	Operating System SWB	73

A.2.1	Activate Windows SWB from WriteProtection Registry	73
A.3	Abstract class .c files	75
A.4	Abstract class .h files	80
A.5	Dual Bus Bridge Hardware and SAT protocol	83
A.6	NIST CFTT Federated Testing	84
A.7	Portability Metrics	87
B	Curriculum Vitae	88