

CONTENT

APPROVAL	i
SELF DECLARATION AGAINST PLAGIARISM	ii
DECLARATION FORM	iii
ABSTRACT	iv
PREFACE	v
CONTENT	vi
PREFACE	vii
LIST OF TABLES	ix
LIST OF FIGS	x
1 INTRODUCTION	1
1.1 Background	1
1.2 Problem Identification	2
1.3 Objective	2
1.4 Scope of Works	3
1.5 Hypothesis	3
1.6 Methods of Research	4
2 LITERATURE STUDY	5
2.1 Internet/ Wide Area Network	5
2.2 Virtual Private Network (VPN)	7
2.3 Software Define Wide Area Network (SD-WAN)	7
2.3.1 SD-WAN Technology	9
2.3.2 Secure SD-WAN Option	10
2.3.3 SD-WAN Architecture	11

2.4	SD-WAN Opportunity	11
2.5	Economic Feasibility	11
2.5.1	Cost Structure	12
2.5.2	Economic Feasibility Tools	12
2.6	Regulation Aspect.....	14
2.7	Customer Potensial User.....	15
3	METHODOLOGY AND SCENARIO	16
3.1	SD-WAN Implementation and Cost Flow Chart.....	16
3.2	Data Calculation	17
3.2.1	SD-WAN Requirement and Architecture	19
3.2.2	SD-WAN Technology	21
3.2.3	Defined Scenario.....	24
3.2.4	SD-WAN Testing Implementation Planning	24
3.3	Regulation Analysis.....	26
3.4	Techno Economic Cost Benefit Analysis of SD-WAN.....	26
3.5	Case of Study XYZ Mining Company	27
4	TECHNICAL AND ECONOMIC ASPECT-----	30
4.1	Technical Aspect	30
4.1.1	SD-WAN Planning Implementation Recommendation.....	31
4.1.2	Result Implementation SD-WAN Testing Scenario	33
4.1.3	Device Standard and Regulation.....	42
4.2	The Economic Aspect of Implementation	43
4.2.1	Capex and Opex	49
4.2.2	Technology Investment Feasibility Analysis.....	53
4.2.2.1	Net Present Value and Payback Period	53
4.2.2.2	Internal Rate Return (IRR) Implementation	55
4.2.2.3	Sensitivity Analysis Implementation	56
4.3	Regulation Aspect	60
5	CONCLUSION AND FUTURE RECOMMENDATIONS	61

5.1	Research Conclusion	61
5.2	Future Work Recommendation.....	62
6.	REFERENCE.....	63
7.	ATTACHMENT.....	67