

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

The Key Application of Mathematics in Current Innovations - A Case Study on 5G and Ubiquitous Connectivity

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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TABLE OF CONTENTS

LIST OF TABLES	V
LIST OF FIGURES	V
SUPERVISOR APPROVAL	VI
AUTHOR DECLARATION	VII
ABSTRACT.....	VIII
CHAPTER 1	1
INTRODUCTION.....	1
1.1 Motivation.....	1
1.2 Problem Statement	3
1.3 Objectives	4
1.4 Significant and Benefit of Study.....	4
1.5 Scope and Limitation of Study	5
1.6 Definition of Terms.....	7
CHAPTER 2	8
LITERATURE REVIEW	8
2.1 5G and Ubiquitous Connectivity	8
2.2 Relative Comparative Advantages (RCA).....	12
CHAPTER 3	15
METHODOLOGY AND IMPLEMENTATION.....	15
3.1 Methodology Flow Chart	15
3.2 Relative Comparatives Advantages	16
3.3 RCA Model Calculations	16
3.4 Tables and Figures	17
CHAPTER 4	21
RESULT & DISCUSSION	21
CHAPTER 5	29
5.1 CONCLUSION	29
5.2 RECOMMENDATIONS.....	30
REFERENCES	31
APPENDIXES	34
APPENDIX A – Distance from cell tower to area of study	34

APPENDIX B – Internet speed collected in OpenSignal application.....	35
APPENDIX C – Number of devices connected to hotspot.....	38
APPENDIX D – Matlab coding to form a graph.....	41

ABSTRACT

This study explores the intersection of 5G technology, ubiquitous connectivity, and the pivotal role of mathematics in optimizing network performance. Motivated by the transformative potential of 5G, the research investigates the impact of this technology on internet speed and its correlation with ubiquitous connectivity. The study employs the Relative Comparative Advantages (RCA) model to analyze and optimize 5G networks. RCA analyzes the relative strengths and weaknesses of different network components (e.g., number of device and distance) across different geographical regions or deployments. This helps identify areas where specific resources, like additional bandwidth or improved hardware, could have the most significant impact on overall network performance. The investigation reveals a positive correlation between ubiquitous values and internet speed, providing valuable insights for network deployment strategies. Recommendations include prioritizing infrastructure deployment in areas with higher ubiquitous values and investing in the continuous refinement of mathematical models for network design. The study emphasizes the importance of balanced device distribution for reliable connectivity and underscores the need for enhanced security measures to safeguard the integrity of data transmitted over 5G networks. Furthermore, the research suggests collaborative efforts for standardization among industry stakeholders, regulatory bodies, and standardization organizations to ensure interoperability and seamless user experiences. The study concludes with a call to action for stakeholders to adopt strategic recommendations, contributing to the evolution and optimization of 5G networks in an increasingly connected world. the findings of our research can be generalized to the form of network technology in order to stabilization the network of 5g and ubiquitous connectivity in the future Overall, this abstract encapsulates the key findings, recommendations, and implications of the study, providing a succinct overview of the complex interplay between 5G technology, ubiquitous connectivity, and mathematical optimization.