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CHAPTER I

INTRODUCTION

1.1. Background

The development of information and communication technology (ICT) has profoundly impacted the way individuals interact with digital services and engage in economic and social activities. One of the most revolutionary innovations in recent years is the emergence of fifth-generation (5G) mobile network technology, which offers ultra-fast data transmission, ultra-low latency, and the ability to connect millions of devices simultaneously. Unlike its previous versions, 5G is not merely an upgrade but serves as the core infrastructure for future digital ecosystems, enabling the implementation of advanced technologies such as the Internet of Things (IoT), autonomous vehicles, augmented reality, and smart city systems [1][2].

In Indonesia, the rollout of 5G is advancing strategically, especially in major urban centers like Bandung, a city known for its growing digital innovation and creative economy. However, the development of 5G infrastructure across the country is still in its early stages, with many regions, including Bandung, facing challenges in terms of uneven infrastructure distribution and limited access to 5G coverage. As a result, the widespread adoption of 5G remains constrained, particularly in residential areas where access to robust 5G infrastructure is still limited. [3]. The process of technology adoption is often complex, shaped by a variety of factors, both technical and non-technical, that interact in different ways.

Everett M. Rogers' Diffusion of Innovations Theory explains that the adoption of any innovation, including 5G, is influenced by the characteristics of the technology, the communication channels through which information spreads, the social system, and the decision-making process of users. In the case of 5G, this theory emphasizes how factors such as the technology's perceived advantages, compatibility with existing systems, and ease of use influence adoption rates [4].

Infrastructure plays a fundamental role in the adoption of 5G technology. Unlike 4G, 5G demands dense networks of small cells, fiber-optic backhaul, and edge computing nodes to fully realize its potential. As outlined in Indonesia's Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020–2024, the country has set ambitious goals to enhance digital infrastructure, with a planned investment of approximately IDR 435,2 trillion in developing telecommunications infrastructure,