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Cognitive Transformation in Personal IoT: Pioneering Intelligent Automation

Bisma Gulzar[a], Shabir Ahmad Sofi[a] and Sahil Sholla[b]

[a]Department of Information Technology, National Institute of Technology, Srinagar, India; [b]Department of Computer Science Engineering, Islamic University of Science & Technology, Srinagar, India

ABSTRACT

In recent years, IoT has transformed personal environments by integrating diverse smart devices. This paper presents an advanced IoT architecture that optimizes network infrastructure, focusing on the adoption of MQTT protocol and introducing Cognitive Smart Objects for managing personal IoT applications. These objects use Neural Networks to predict optimal actions based on user behavior patterns. A Continuous Learning mechanism enables real-time adaptation of the network to evolving user interactions. The study highlights the role of Cognitive Transformation in Personal IoT, driving intelligent automation and enhancing user experience.

Introduction

In the world of interconnected devices, the rise of the Internet of Things (IoT) has heralded a new wave of technological advancements. With the rapid expansion of IoT systems, there is an increasing demand for solutions that go beyond traditional rule-based algorithms and harness cognitive capabilities vital for intelligent automation, predictive analytics, and proactive intervention [1. This demand has led to the emergence of Cognitive Transformation in IoT, a paradigm shift that empowers systems to understand, learn, predict, and adapt independently. Cognitive Transformation has significant potential to revolutionise various sectors, particularly the growing field of the Personal Internet of Things (PIoT) [2]. In the realm of Personal Internet of Things (PIoT), interconnected devices serve individual needs by delivering highly personalised and interconnected services [3]. This transformative shift is enabled by the integration of immersive technologies like digital twins, virtual reality (VR), augmented reality (AR), blockchain, robotics, and artificial intelligence within the digital framework. This integration embeds intelligence into systems, enabling the smooth exchange of information across diverse environments.