Chapter 4

A Systematic Mapping of Studies on the Adoption of Internet of Things to Provide Healthcare Services in Developing Countries

Macire Kante
https://orcid.org/0000-0001-5425-4549
University of Johannesburg, South Africa

Patrick Ndayizigamiye
https://orcid.org/0000-0001-5721-6070
University of Johannesburg, South Africa

ABSTRACT

This chapter presents a systematic mapping of studies that investigated the adoption of IoT-based healthcare services in developing countries. Specifically, this chapter investigates the current drivers and challenges of the adoption of IoT-based healthcare services in developing countries. It further investigates technology acceptance models/theories that have been used in IoT-based healthcare research in developing countries. The chapter suggests that there is a need to undertake more studies on IoT-based healthcare services in developing countries that are anchored on a theoretical foundation to enhance the understanding of the drivers and inhibitors of the adoption of such services. Such understanding will help devise strategies that could stimulate the adoption and use of IoT-based healthcare services in developing countries.

INTRODUCTION AND BACKGROUND

Internet of Things (IoT) is one of the main enablers of the Fourth Industrial Revolution (4IR). IoT offers new opportunities that combine mental, physical and mechanical work (Bloem et al., 2014; Kante, 2020). Medical care and health care are some of the most attractive applications of IoTs (Islam, Kwak, Kabir, Hossain, & Kwak, 2015; Kante & Ndayizigamiye, 2020) as there are various applications of IoTs in the context of healthcare. For instance, mHealth, one of IoTs applications, has been hailed for its potential for supporting personalized healthcare such as remote monitoring of patients (Ndayizigamiye & Matlala, 2018; Ndayizigamiye & Maharaj, 2016), self-healthcare monitoring (Soni, Ndayizigamiye, Kanté, 2019); and public healthcare (Ndayizigamiye, Hangulu, & Akintola, 2017; Matiyabu, Ndayizigamiye, & Maharaj, 2017).

However, the design of ICT-based interventions for development purposes including IoTs must take into consideration the context in which they are deployed (Whitmore, Agarwal, & Da Xu, 2015; Ndayizigamiye, 2016; Ndayizigamiye & Maharaj, 2016; Ndayizigamiye, Soni & Jere, 2018; Matiyabu & Ndayizigamiye, 2019; Ndayizigamiye & Dube, 2019). Particularly, as developing countries are embracing the 4IR, there is a need to be aware of the current challenges and enablers of the adoption of IoT- based healthcare services in such settings. Such awareness will assist in devising IoT-based healthcare interventions tailored to the settings in which they are applied.

This chapter presents a systematic mapping of studies of the adoption of Internet of Things to provide healthcare services in developing countries. The chapter analyses the challenges, the enablers of the adoption of IoTs in healthcare as well as the theoretical frameworks that have been used in in IoT-based healthcare research in developing countries. The chapter starts with a description on the concepts of 4IR and IoT in the healthcare context. The chapter then describes the adopted methodology and the findings. The chapter then discusses the findings followed by the conclusion and suggestions for further research.

The Fourth Industrial Revolution and Developing Countries

The Industrial Revolution has occurred in four stages. The first stage "acceleration" occurred toward the end of the 18th century and was characterized by mechanical production; the second Industrial Revolution began in the 20th century with the introduction of the conveyor belt and mass production; the third was introduced through the digital automation of production by means of electronics and information technology (IT) from 1950 to 2000; and at present, we are at the beginning of the fourth stage of the Industrial Revolution often termed as the 4th Industrial Revolution

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