Chapter 11
Can Artificial Intelligence and Big Data Improve Gamified Healthcare Services and Devices?

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ABSTRACT

Systems that aim to maintain and improve the health of citizens are steadily gaining importance. Digital transformation is having a positive impact on healthcare. Gamification motivates individuals to maintain and improve their physical and mental well-being. In the era of artificial intelligence and big data, healthcare is not only digital, but also predictive, proactive, and preventive. Big data and artificial intelligence techniques are called to play an essential role in gamified eHealth services and devices allowing to offer personalized care. This chapter aims to explore the possibilities of artificial intelligence and big data techniques to support and improve gamified eHealth services and devices, including wearable technology, which are essential for digital natives but also increasingly important for digital immigrants. These services and devices can play an important role in the prevention and diagnosis of diseases, in the treatment of illnesses, and in the promotion of healthy lifestyle habits.

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INTRODUCTION

Systems that aim to maintain and improve the health of citizens are steadily gaining importance. The quality of health services in the society is a very important factor to individuals. Healthcare services offered for the prevention or diagnosis of diseases, or for the treatment of illnesses, are essential to maintain and improve the physical and mental well-being of the citizens.

As many experts point out, digital transformation is having a positive impact on healthcare. Telemedicine, mHealth, wearable healthcare devices, Artificial Intelligence enabled medical devices or blockchain based electronic health records are just a few examples of digital transformation in healthcare which are completely reshaping how individuals interact with healthcare professionals, how their data is shared and how decisions are made about individuals' prevention and treatment plans (Reddy, 2020).

At the same time, gamification has been gaining ground in the field of health, largely thanks to the use of technology, and is currently being applied in many areas, ranging from fitness and healthy lifestyles to diabetes control. One of the main drivers of this change is mobile technologies where there is a fast-growing number of healthcare applications offering services of preventive care.

In addition, wearable healthcare devices designed to collect data on the health and personal activity of users, are rapidly becoming everyday companions of individuals. On the one hand, these portable devices offer interesting gamification opportunities, and on the other hand individuals are increasingly concerned about their health and these devices give them the opportunity to monitor their health in a way that was not possible until now.

In this chapter the authors aim to explore the possibilities of combining Artificial Intelligence and Big Data techniques with gamified elements and procedures to enhance eHealth services and devices, including wearable technology, which are essential for digital natives like millennials, but also increasingly important for digital immigrant generations. At the end of the chapter, the main conclusions obtained are presented, as well as a discussion about possible future lines of research.

GAMIFICATION IS ALL AROUND

Gamification refers to the use of game design elements and procedures within non-game contexts (Deterding et al., 2011). Gamification involves applying game design techniques, game mechanics, and/or game style to non-game situations to engage users and to facilitate them the solving of problems in a fun way.

Many experts think that the philosophy of gamification can be successfully applied in very different domains, allowing offering enhanced and motivating applications and services to the user (Werbach & Hunter, 2012; Zichermann & Cunningham, 2011; Zichermann & Linder, 2013).

Gamification is increasingly and better accepted by society. Today's children and young people are digital natives who have grown up in homes and schools where technological devices are common and are the door to access a myriad of services, products and experiences.

In addition, many schools are carrying out digitization projects in their classrooms. Children use applications such as Kahoot, Classcraft or Educaplay, which makes them feel like absolute protagonists of a wonderful game that is the game of learning. As protagonists of their favourite videogame, students accumulate points and level up, can choose which armour to wear every day, and they even have numerous powers that allow them, for example, to save a classmate who did a math operation wrong, or to

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