Chapter 16
Sustainability Design Applied to the Digital Signature of Documents

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ABSTRACT

Information and communication technologies can be an added value in order to provide integrated services to customers. With the technological advancements of the last decades, writing is increasingly done in electronic documents. Digital signatures are designed to ensure authentication, integrity, and non-repudiation of such documents. The methodology was based on the literature review of the field, as well as the description of the case study which emphasizes the added value of the developed application, since it addresses concerns of several dimensions of sustainability. The purpose of the chapter is to describe a case study in which an Android mobile application, SoftDigital, was developed for document flow management in a hospital environment, meeting the principles of sustainability design for the development of software systems. It is therefore considered that the main conclusions are to allow healthcare professionals and patients (or their legal representative) to integrate their digital signature into documents for approval of treatments electronically.

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INTRODUCTION

Currently, people have different forms of access to devices that enable access to the Internet from computers, smartphones, tablets and smart watches. Mobile marketing is constantly evolving and innovating, in order to motivate customers to use it. This innovation, in terms of digital transformation, became possible thanks to the existence of numerous applications providing improvement in the quality of life of the population and solving everyday problems.

In order to solve everyday problems, the developed project consists of a mobile application on Android - SoftDigital (Ovelheiro, 2019), for the management of documents in a hospital environment, allowing health professionals and users (or legal representative of the user) to integrate their digital signature in documents for electronic treatment approvals (Ovelheiro & Silveira, 2020). The application allows fully digital workflows, with the ability to upload and send documents so that the respective people can sign them. It also allows users to receive notifications and view the status of the document at any time.

Security is considered indispensable in all types of computer applications because there is a need for greater reliability and confidence in all information, including its origin. In fact, security (Mamede, 2006; Wang, Duong & Chen, 2016) is an important issue when designing an application with a digital signature system. A breach in information security could jeopardize a confidential document, which could be signed using a private key not owned by the signer. On the other hand, (Russo & Reis, 2019) advocate that preparing a continuity plan, which does not necessarily need to have a high complexity in the case of small organizations, in order to analyze risks, and understanding how to continue the business in the event of a disaster and recover from that disaster, are crucial activities in business continuity and should be understood as adding value to organizations and not just as a requirement to be met or solely to be in compliance. Digital signatures are designed to ensure authentication, integrity and non-repudiation of electronic documents (Fortunato, 2018).

The motivation to develop this chapter focuses on the opportunity to present the development of a solution to an organizational problem identified by a health professional. It was mentioned that for each exam that the patient does a document has to be signed for the patient to be informed. It was emphasized that with a digital signature, much less paper and time would be spent. In this way, sustainability and resource savings are being promoted.

In this way, the reason for the realization of the project was to create a viable solution to facilitate integration with the qualified signature (AMA, 2019) of the hospital's digital documents, create document flows, stop paper and cartridge waste, reduce waiting time and contribute to the digital transformation and automatization of resources. The application will take into account the limitations of mobile devices, when compared to a traditional computer, due to possible technical, ergonomic or economic implications in the development of applications (Anacleto, et al., 2014).

This chapter is organized into five sections. The first is the introduction in which the need identified in the organizational context is presented, specifying the objective of the chapter. In the second section, the theoretical framework is presented with regard to the various themes that are addressed in the chapter. The development of the Mobile Application is presented in the third section in order to present the concerns underlying sustainability. The fourth section describes the procedures underlying the verification and validation in order to assess whether the developed application meets the requirements and if it implements the principles of the Karlskrona Manifesto. Finally, in the fifth section, conclusions are drawn and proposals for future work are presented, in order to envision the evolution of the work developed.