

eWarranty, the solution for buyers, stores and services

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Abstract

Decision-makers in fields as diverse as industry and services face a number of challenges while working to develop safe, sustainable and environmentally friendly products. Identifying customer needs and ensuring excellent service are key decisive factors for success in almost all areas of business. Traditional services will be gradually replaced by state-of-the-art integrated e-commerce systems, which are not limited to creating catalogs with advanced search engines, offering solutions to much more complex problems, such as the one addressed in this presentation, respectively, the management, governance and analysis of large data used to ensure the guarantee of the quality of a purchased product or service. The purpose of this communication is to present an application, which is in the development phase, consisting of three interconnected software solutions that are individualized according to the beneficiary user, all based on an application that runs all the processes related to them. Therefore, the three "client" applications that will work on the principle of client-server applications are: Application for persons (customers) - intended for buyers; Application for stores - intended for shops that sell items with a warranty; Service application - for companies that service items under warranty. The problem that we want to solve through this application is the lack of an efficient and digital way to manage products with warranty, as well as the gap between the buyer, the trader and the service in tracking the life cycle of a product with warranty, from purchase to scrapping and recycling. eWarranty offers an innovative IT solution that is fast, secure, sustainable, and environmentally friendly. The new system is designed for the digital management of all data related to a guarantee, with a flexible architecture, allowing the adaptation of the system to other products, services, or other potential actors.

Keywords: warranty, big data, services, smart people.

1. Introduction

Decision-makers in fields as diverse as industry and services face several challenges while working to develop safe, sustainable, and environmentally friendly products. Identifying customer needs and ensuring excellent service are key decisive factors for success in almost all areas of business. The emergence of digital market services and IT systems also plays an important role for the consumer, not just for SMEs. Traditional services will be gradually replaced by state-of-the-art integrated e-commerce systems, which are not limited to creating catalogs with advanced search engines, offering solutions to much more complex problems, such as the one addressed in this presentation, respectively, the management, governance and analysis of large data used to ensure the guarantee of the quality of a purchased product or service.

The analysis of consumer behavior in the digital age is especially important because it incorporates customer requirements and preferences and contributes to the development of the marketing and advertising process, as well as to an efficiency of work in the right direction, customer satisfaction. Through the purchasing decision, consumers influence the sales and, even, the profile of a company and, therefore, any marketing and communication activity must be analyzed and carried out in relation to their needs. John Naisbitt [1] claims

that the evolution of the world is towards globalization, the fragmentation of the market by economic systems proving to have a strong impact on the consumer, the concentration of marketing on economic poles with an emphasis on the digital sphere will become a necessity.

While in the past the focus was mainly on identifying socially conscious consumer characteristics, more recent work has been focused on identifying the underlying consumer motivation and satisfaction and explaining the relationship between cognitive or motivational factors and customer behavior [2].

The realization of eWarranty application started from the identification of a practical problem observed in the daily activity that has an impact on a very wide category of population: the difficulty of properly managing the different commercial or conformity guarantees related to the different products or services purchased. Currently, a wide range of products and services are sold accompanied by a commercial guarantee and compliance, according to the legislation in force. The practical problem arises when the buyer finds a technical or compliance problem and wants the warranty to be activated. At that time, often more than a year after purchasing the product, he must have at his disposal a whole series of documents, which are often difficult to find or reconstruct.

A different problem from the seller's point of view related to the management of the different commercial guarantees or conformity for the marketed products is that of the resources allocated to drawing up the necessary documents in the relationship with the customer. Given that some stores sell thousands of different products bearing warranty, from dozens of different manufacturers, they have to manage different warranty contracts, allocating for this staff and space for the management of a very large number of documents.

From the analysis of the applications identified so far, the vast majority are different forms of the same type of application: a digital wallet, in which the user stores information about guarantees, the data entry being very different, from photos and scans to the manual entry of information. Another category of applications also performs related services, such as service, but only for certain products, being applications specific to a manufacturer and without the involvement of the sales service. A conclusion of the research carried out is that no other application has been identified with integrated functionalities such as buyer / trader / service similar or at least close to those targeted by this application.

eWarranty is a digital application intended for the three main actors: the consumer, the supplier of the guaranteed entity (the seller, manufacturer or service provider) and the specialist providing under warranty repairs, in order to ensure quick and efficient access for all those involved to all information on the warranty of a product, service or process, while generating a wide range of useful information on various commercial or technical aspects, based on the analysis of a large volume of data.

eWarranty offers a fast, safe, sustainable, and environmentally friendly innovative IT solution. The new system is designed for the digital management of all the data related to a guarantee, but the architecture is designed so as to be as flexible as possible, to allow the

adaptation of the innovative system to other products or services, to add other potential players on the Romanian market and/ or to be extended to the European market.

The problem that the application aims to solve is the lack of an efficient and digital way to manage products with warranty, as well as the gap between buyer, merchant and service in tracking the life cycle of a product with warranty, from purchase to scrapping and recycling.

2. The solution

eWarranty is an information system for managing guarantees in a digital way, composed of the following applications:

- SaaS application running in the browser, with double role: used by traders to create and manage warranties, as well as to generate statistics on the products sold; used by technicians to create and manage service sheets, as well as to generate statistics on repaired products;
- Mobile app interconnected with the software as a service (SaaS) app, used by buyers to add and manage products with warranty;
- mobile application interconnected with the SaaS application, used by technicians to streamline the process of receiving / handing over a product with warranty.

The goal is for eWarranty to become the default way of managing products with warranty, an effective and environmentally friendly alternative to the traditional way using the printed invoice.

The platform has three types of commercial users, two of them also having an administrative role, defined as follows: 1. Buyer, 2. Trader, 3. Service.

2.1. The buyer

For the buyer-type user, who can be a natural or legal person, the framework has been created for him:

- a) to be able to download and install the application for free from the Google Play or iTunes store, to manage the list of products with warranty;
- b) to be able to easily create a list of purchased items under warranty, edit it and manage those items;
- c) to be able to easily consult the status of guarantees within the validity period;
- d) to have access to the necessary documents to activate a guarantee;
- e) to have access to information about the courses of action for activating a guarantee;
- f) to have access to information related to the objects in service.

How it works in brief: the user downloads and installs the application for free from the store of the device they have (Google Play or iTunes). Then, at any store that implements the system, upon completion of the purchase, according to the law, the user receives an invoice or an equivalent document, hereinafter generically called an invoice. On the invoice or separately on the seller's screen, together with the invoice, a QR Code is generated for scanning. The user opens the app and scans this QR Code, and all related information is automatically taken into their app in digital format, including the self-completed digital warranty form, invoice and tax receipt.

2.2. The trader

For the trader type user, the specific functionalities for three different roles are defined: user, manager and administrator. The trader type user has the possibility:

- a) to define and edit warranties, manage the database of warranty-bearing products;
- b) to define links between each product and its corresponding service procedure;
- c) to interconnect the app with the seller's billing app;
- d) to extract commercial information related to the products and the activation of their guarantees;
- e) to manage the access codes of their own employees;
- f) to have access to an interface through which a third-party application of the seller can do the management of the users of the application.

The application intended for the merchant is of the SaaS type and is offered for a fee to the stores willing to use. The application has a management module and a user one. The management module allows the seller to define and versionize guarantees (it can scan the model provided by the supplier and based on it can define the fields that will be filled in automatically). Also, this module gives the possibility to establish the details related to the names and contacts of the companies that service the respective good or range of goods. The management module also shows statistics regarding the products sold as well as allows the management of the access accounts of the seller's employees (there is also an API through which a third-party application of the seller can manage the users of this application). The use module allows a commercial worker at the seller's guarantee office or even the person at the cashier to print the guarantee if desired (automatically filled in with all the necessary data).

2.3. The service

For the service user, the application has two components - a software as a service (SaaS) application that is offered for a fee to stores eager to use and an IN/ OUT application, mobile - interconnected with the SaaS application, which has the role of facilitating the entry and exit from the service based on QR code of an object. For the service application there are four types of actors: the user, the manager, the administrator and the technician.

The service has the possibility to:

- a) be able to define and version the forms of the service sheets;
- b) access statistics on serviced products;
- c) access the history of serviced products;
- d) manage the access codes of their employees;
- e) have access to an interface through which a third-party app can manage the app's users;
- f) allow employees to receive products for repairs;
- g) allow employees to hand over the products brought for repairs.

The SaaS application has two modules: a management module and a use module. The management module gives the possibility of defining and versioning the forms of the service sheets (with the automatic retrieval through QR Code of the buyer's data). The management module also shows statistics on the products served as well as the

management of the access accounts of the employees of the service (there is also an API through which a third-party application of the service can do the management of the users of this application). The use module gives the service employees the possibility to receive goods for repairs, write observations when taking over, research the repair history, write observations at the completion of the repair and issue a QR code with the exit from the service.

2.4. Server application

The Server application part that supports all other applications described is developed as a 3-tier distributed enterprise compliant application to be scalable and distributable. The application runs in real time and can be configured using fail-over mechanisms. The solution runs in an application server and connects to a database.

The platform guarantees stability for at least 1000 concurrent users and has a maximum performance of 5 seconds for accessing any functionality (except material or high volume data loading functionalities) under concurrent access conditions at full capacity if there is adequate network and hardware connection. The solution is an application that delivers access to data for Client applications in real time, capable of running scalably and distributed, guaranteeing operations performed in order of performance and without troublesome delays for end users.

The Server application as a whole is compatible with a wide range of operating systems and database types and can be installed on various server structures, depending on the use and the estimated number of users.

3. Conclusions

eWarranty is an application aimed equally at buyers and sellers. Using the application, buyers will have at their disposal a useful and fast tool for managing and using commercial guarantees for purchased items. For sellers, the application means a streamlining of the workflow and a saving of resources.

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