

# AN INNOVATIVE TECHNOLOGY PROPOSAL FOR IMPROVING COMMUNICATION, SOCIAL REPUTATION, AND SERVICE QUALITY: A CASE APPLIED TO THE HOSPITALITY SECTOR

Una propuesta de innovación tecnológica para la mejora de la comunicación, la reputación social y la calidad del servicio: caso aplicado al sector de la hostelería

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## Abstract

In this paper it is presented a new mobile application called *RE2*, that was designed to help service sector professionals with managing information related to customers and services. It is based on one of the most interesting recent developments within the framework of customer management: customer engagement. In particular, *RE2* digitizes customers' loyalty cards, recording the personal data and consumption patterns of customers. Using this information, *RE2* aims to achieve an improvement in service quality, communication strategy, and social reputation by organizing the reward program automatically and suggesting connections for customers to their social networking sites, where customers can then disseminate their experiences with the business. This paper presents the theoretical bases used to develop *RE2*, describes its main functions, and explains its main contributions to the special case of the hospitality industry (although the application can be applied to other industries).

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## Keywords

Social networking sites; Electronic word of mouth; eWom; Customer engagement; Knowledge management; Management and planning.

## Resumen

Se presenta una novedosa aplicación móvil llamada *RE2*, diseñada para ayudar a los profesionales del sector servicios en la gestión de la información de clientes y servicios. Esta basada en uno de los desarrollos más recientes en el área de la gestión de clientes: el compromiso del cliente. En particular, *RE2* digitaliza la tarjeta de fidelización de clientes para grabar sus datos personales y sus patrones de consumo. Utilizando esta información, *RE2* pretende conseguir una mejora en la calidad del servicio, la estrategia de comunicación y la reputación corporativa, organizando el sistema de recompensas de forma automática y sugiriendo una conexión al cliente con sus redes sociales, donde pueden diseminar sus experiencias con el negocio. Este trabajo presenta las bases teóricas utilizadas para desarrollar *RE2*, describe sus principales funciones y contribuciones al negocio, aplicado al caso particular de la hostelería (aunque la aplicación puede ser aplicada en otros sectores).

## Palabras clave

Redes sociales; Comunicación boca a boca electrónica; Compromiso del cliente; Gestión del conocimiento; Planificación y gestión.

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## 1. Introduction

Despite the fact that a large part of the economy in high and middle-income markets is generally focused on services, traditional techniques to increase sales and growth with the use of technology have not been fully exploited within this sector. At the same time, the majority of the academic research in technology and innovation management is focused on manufacturing, and only a small fraction considers service-related technology and innovations (Linton, 2009). However, from a managerial point of view, innovations related to business intelligence and knowledge management constitute an important source of differentiation in the service industry (Korte; Ariyachandra; Frolick, 2012), and also offer a competitive advantage (Bilgihan *et al.*, 2001). Therefore, this article proposes and describes an innovative technological application designed to improve service quality, customer management, communication strategy, and social reputation for the service sector. The tourism sector in Spain will be used to delve further into the meaning of the proposed application.

The Spanish tourism sector is among the largest in the world because of visitor volume, falling just behind France and the USA (World Tourism Organization, 2015), and represents more than 10% of Spain's GDP. Consequently, the tourism sector in Spain employs over 2.3 million workers in areas such as hotels, restaurants, bars, pubs, and cafes (Ernst & Young, 2013). However, the tourism and hospitality industry (more specifically restaurants, bars, pubs, and cafes) is labor intensive with low productivity in comparison to other sectors. The difficulty in increasing productivity in the hospitality sector (in terms of sales volume) lies in that fact that it is service based, and a service cannot be stored and its production cannot be industrialized in order to generate economies of scale (Candela; Figini, 2012). Therefore, the

common way to increase sales volume within this sector is to raise the number of employees. In addition, the hospitality sector experiences low stability in their employment rate which complicates knowledge management in the company (Kim; Hancer, 2010) creating an important limitation because customer service plays a key role within this context (Chen; Liu; Chang, 2013). Good customer service often involves remembering customers' consumption patterns or even customers' names by employees, something that is difficult to achieve by unstable staff.

Consequently, the aim of this article is to introduce and describe *RE2*, a new hardware-software solution designed for the hospitality industry to improve service quality, customer management, communication strategy, and social reputation. In particular, *RE2* involves a change related to the traditional passive role of customers to an active one in order to integrate their functional contribution to the business. More specifically, *RE2* is designed to digitize customers' loyalty cards by recording personal data and the consumption patterns of each customer. Using this information, *RE2* aims to improve service quality by capitalizing on one of the most valued skills among hospitality employees: better customer service based on customers' information and consumption patterns. *RE2* also organizes the reward program and automatically proposes rewards to more loyal customers and, at the same time, improves relationships with customers who feel that the reward they have received is according to their consumption. *RE2* also suggests to customers a connection with their social networking sites (SNSs), where they can share their experiences about the business, generating electronic word-of-mouth (e-wom). In other words, when using *RE2*, customers can have a role in creating marketing communication through their social networks (i.e., positive or negative) about the service. As a result, the proposed application aims to improve the social reputation of hospitality

businesses in cooperation with customers, while avoiding expensive traditional advertising campaigns. *RE2* improves customer management and, therefore, increases the number of loyal customers and the sales volume –ultimately improving business performance.

## 2. Customer relationship management and e-wom: An overview

The ability to identify profitable customers and build long-term loyal relationships with them is a key factor in the current, highly competitive, business environment, especially in the hospitality sector (Wei *et al.*, 2013). Service companies obtain numerous benefits from their long-term customers (Kumar; Shah, 2004): they buy more and are less costly to serve because they are strongly committed to the company (Mishra; Li, 2008). Indeed, one of the most valuable company assets is its customer base, and as a result companies are successfully using customer data in their marketing strategy to develop and extend customer relationships and enhance customer learning (Verhoef; Van Doorn; Dorotic, 2007). In particular, customer relationship management (CRM) is a business strategy that helps businesses achieve their goals of retaining the most profitable customers and increasing purchases made by them (Jain; Singh, 2002). CRM can be used for personalizing the customer experience and improving customer satisfaction and retention, especially within the tourism sector because it is service-based (Padilla-Meléndez; Garrido-Moreno, 2014). Consequently, customers are not considered equal in CRM and the company does not provide the same offers to all customers. *RE2* offers the possibility to implement a user-friendly way to implement a CRM system specially designed for the hospitality industry.

‘ Tourism and hospitality industry have a high labor-intensive factor and a low productivity in comparison with other sectors, and technology can help to manage knowledge and information within this sector ’

In addition, the world is now immersed in the era of big data (McAfee; Brynjolfsson, 2012), which seeks to glean intelligence from data and translate it into a business advantage. Big data systems use many machines working in parallel to store and process data that can be built and run by a small team (Marz; Warren, 2015). Customer data recorded in company databases and data warehouses is a new source of competitive advantage and can be used to develop a reward program using *RE2*. Implementing a fair reward program requires companies to maintain a register about their customers and their consumption patterns as a base for rewards. *RE2* implements a useful way to obtain customer data digitizing customer loyalty cards using a smartphone. Through the use of the digital loyalty card, companies are able to better understand customers' requirements and tastes based on the knowledge recorded about customers' past consumption patterns. However, the treatment of cus-

tomers' data should always be done with caution to avoid harming the relationship with the customer. Indeed, when a company offers reasonable rewards to customers based on their previous consumption patterns, it can enhance customer fairness perception and stimulate customer adoption of the rewarded behaviors (Moorman, 1991). In the special case of service customers, they are more likely to perform their roles when they are rewarded. Company feedback to customers in a reward format makes customers feel cared for by the company; consequently, fair rewards motivate customers to behave in a manner beneficial to the company (Dowling; Uncles, 1997), create positive relationships with the reward provider, and contribute to the success of a reward program (Moorman, 1991). However, when a customer perceives that a reward program is unfair, he/she loses the motivation to give what the reward program is expecting (Meglino; Ravlin, 1998). In this case, customers can also lose interest in creating a relationship with the reward provider (Ganesan, 1994). Therefore, companies have to properly attend to their reward programs implementation, because it determines customers' perceptions and consequently, their behaviors towards the company. *RE2* offers an easy way to record customers' consumption patterns in order to be used as a base for a reward program.

The current emphasis on customer-centric business strategies by hospitality firms requires pursuing tactics that steer customer behaviors beyond simple transactions, frequently referred to as customer engagement behaviors (Wei *et al.*, 2013). Although loyalty and retention programs refer to customer engagement behavior with physical businesses (i.e., the establishment), customers also play an important role in the online strategy of businesses through their engagement in online communities (Luarn; Lin; Chiu, 2015; Wirtz *et al.*, 2013). Despite the recent emergence of social networking sites, these sites are quickly evolving into an essential part of many businesses' marketing communication strategies (i.e., companies are increasingly adopting social media tools to provide services, and more importantly, interact with customers (Kim; Lim; Brymer, 2015)). Online business community engagement refers to the customers' intrinsic motivation to interact and cooperate with other community members. Some examples of customer online engagement behaviors include recommendations, helping other customers, blogging, and writing reviews (Algesheimer; Dhokia; Herrmann, 2005).

Despite the fact that involving customers to generate conversation in their own SNSs about a business is a difficult task, this online information can potentially have a significant impact on customers' decision making (Luarn; Lin; Chiu, 2015). For example, sometimes customers cannot easily evaluate products, especially services, without previously receiving a first-hand experience from other customer/s. In this case, customers usually search for information and even advice from their own close relationships. This communication process generates a phenomenon known in marketing communication as Word of Mouth (wom). Wom is defined as interpersonal communication about products and services among customers, which affects the message's effectiveness and evaluations of reviewed goods (Hong; Park, 2012).

Traditional word of mouth (wom) is an effective marketing tool with a great influence on customer behavior. In particular, while traditional advertising may increase recognition of products or services, information obtained from friends and relatives through wom has even more impact on customers' decision making (Khammash; Griffiths, 2011). There are two types of wom:

- positive wom (generated by satisfied customers), which is the most desired by companies (Kim; Kim, 2014); and
- negative wom (generated by dissatisfied customers) (Chiou; Chi-Fin-Hsu; Hsieh, 2013; Pantano; Di Pietro, 2013).

In addition, wom can be disseminated through a wide range of sources (Chatterjee, 2001). The development of information and communication technologies (ICTs), as well as web 2.0, facilitates access to online product reviews and comments written by customers in their SNSs. This type of wom is referred to as electronic word of mouth (e-wom) and is the publication of customer-generated content about companies in their SNSs (Llamero, 2014). E-wom provides organizations with valuable market intelligence and on-going market research opportunities (Chiu et al., 2015). The proposed RE2 system automatically encourages customers who have received a service in a hospitality business where RE2 is implemented, to generate e-wom about the received service and the company in general.

RE2 is a new hardware-software solution designed for the hospitality industry to improve service quality, customer management and social reputation

The present study aims to enable hospitality companies in achieving offline and online customer engagement. In this regard, RE2 is focused on the development of the following customer engagement behaviors: satisfaction and loyalty related to the physical business (via improvement in service quality using customer information recorded in the system), and e-wom generation related to the online business strate-

gy (through an improvement in the communication strategy and social reputation of the business). In particular, RE2 is designed to develop a customer database that is used to organize reward programs and connect with customers' SNSs to receive referrals, which improve the social reputation of the business in cooperation with customers. The conceptual model used to design RE2 is presented in Figure 1.

RE2 improves customer service based on the knowledge generated from customers' information and consumption patterns recorded in the system

### 3. Case study: description of proposed application RE2

Traditionally, when a hospitality customer chooses and purchases a specific service, the employee attending him/her is simply involved in the customer service interaction and billing. The relationship with the customer is then controlled by the business itself and sometimes it is difficult to manage without the help of ICTs. However, the proposed solution requires both employee and customer involvement in the transaction, and the use of ICTs in order to manage all the information generated in each transaction. For this task, both employee and customer make use of a mobile device, smartphone, or tablet (thanks to advanced computing capabilities and ubiquity, mobile devices are changing the current use and understanding of the hospitality industry (Dickinson et al., 2014; Kwon; Bae; Blum, 2013)). In particular, in order to clarify the structure of the proposed solution, the system is divided in three main parts: customer side, employee side, and server side. The description of these three sides is explained below.

#### 3.1. Employee and customer sides

For both the employee and the customer sides, an application for *Android*-based smartphones has been developed jointly with a server. The application runs from *Android* 2.2 to the latest version. The *Android* architecture was chosen

because it has the largest percentage of users worldwide. In addition, *Android* is an operating system that allows software production without many licenses and it also makes it possible to freely distribute the software using a *Google Play* account. Currently, the RE2 application is available free of charge and can be downloaded from this web site:

<http://www.ual.es/~jaberme>

The software may be used in any computer device (whether brand new or

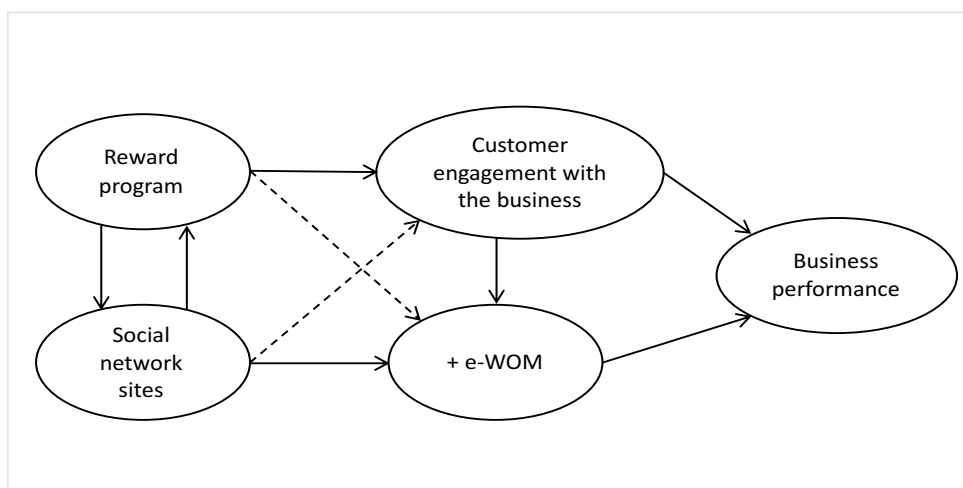


Figure 1. Conceptual model

old) and in any format (mobile, tablet). Hence, any customer (actual or potential) and employee, who have an *Android* device, are able to install and run the *RE2* application for the employee and customer sides.

On the employee side each employee records the interaction of each service in each customer register using a mobile device (with the application previously installed). Each record includes customer identification data (through the *Bluetooth* identifier of each customer), and consumption points (i.e., bonuses), which will serve as a base for a reward in a future purchase with the business. The data is stored in the database that can be accessed by other employees using the same application installed on his/her device. In figure 2 the main functions of the employee side are shown.

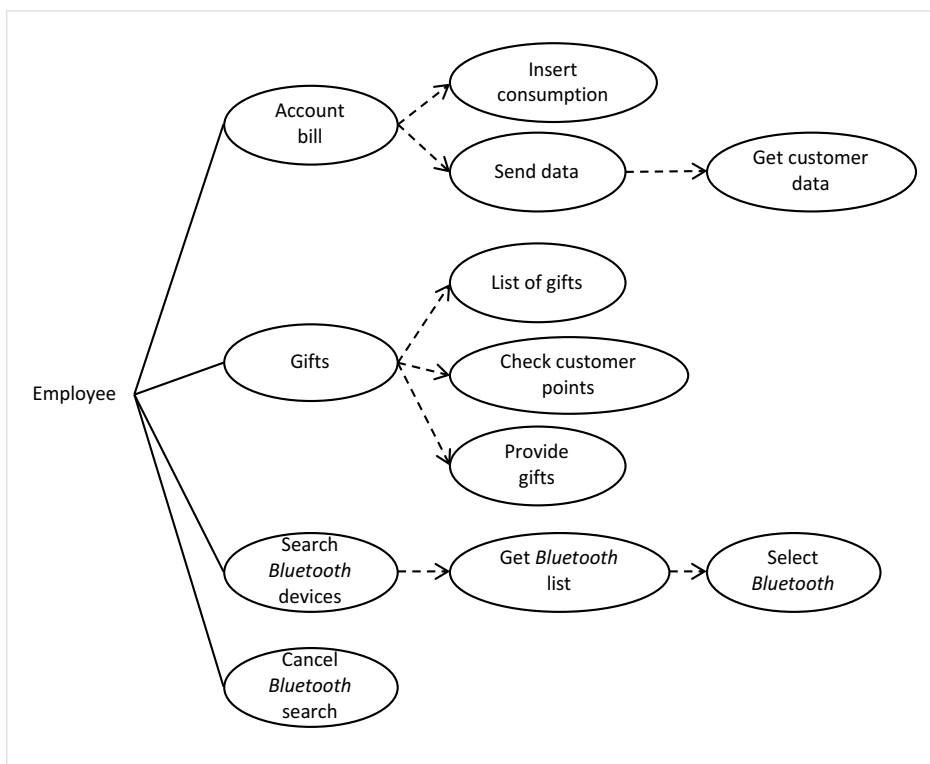


Figure 2. Employee side

On the other hand, on the customer side each customer can also view his/her information through his/her device. Customers have available the same application, but with a limited interface, where they can find their consumption points and the bonuses available with the business. The customer can access the system using his/her media access control (MAC) and see what rewards they may exchange and what remains for more substantial rewards. Furthermore, the system allows the employee to make additional bonuses (i.e., through the employee side), without waiting for the customer to have enough points to unlock a certain gift (reward). Once a reward is delivered, the system offers customers the opportunity to explain their service experience using their social networks (i.e., through the customer side). The system recognizes users who have greater relevance or influence in social networks through querying services such as *Klout* score (Klout, 2008; Serrano-Puche, 2012), that is, the *Klout* score helps the business to identify opinion leaders (a customer with a high *Klout* score has a high level of influence in social networks). In practice, whenever a relationship with a customer starts, the customer presence in *Klout* is checked automatically by the system. If he/she is not in *Klout*, he/she receives a message in his/her mobile device about the possibility of measuring his/her influence in SNSs and an invitation to join *Klout*. At the same time, *RE2* checks whether the selected customer is a follower of the *Twitter* account of the business, otherwise he/she is invited to follow the business with the purpose of providing a more personalized service, which helps the business to improve the offer, and achieve the desired customer engagement. In figure 3 the main functions of the customer side are shown.

### 3.1.1. Description of the mobile application of employee and customer sides

The appearance of the mobile application is shown in Figure 4 (for both the employee and customer sides). When the employee installs the application on his/her device, she/he gets access to the system. In addition, the customer should install the application, although it is not necessary because the employee can get paired (via *Bluetooth*) with the customer by simply asking him/her to turn his/her *Bluetooth* on. On the employee's device the application shows the *Bluetooth* identification to the wireless system, installed at the business place (i.e., server side), in order to identify the cus-

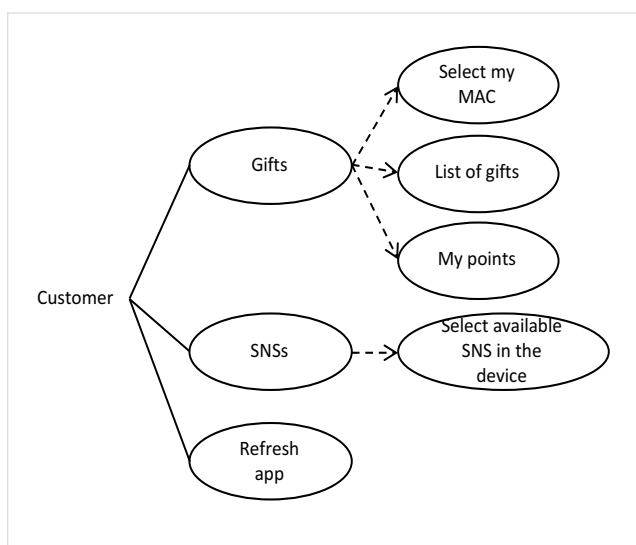


Figure 3. Customer side



Figure 4. Mobile application (employee and customer sides)

tomer. The employee also has the same way to connect to the system. Once the connection is established, the employee (through the application) sends the consumption data to the server. If the customer has the application installed on his/her device (which is free and secure), all the connectivity details are automatically managed by the application. In addition, the application can query the influence of the user in SNSs and ask him/her to promote the business in his/her social networks. All these extra features are only possible if the application is installed and is running on the customer side.

RE2 organizes the reward program automatically proposing rewards to more loyal customers

As we have previously explained, the application is the same for employees and customers, but with two different profiles. The employee connects to the customer, via *Bluetooth*, to perform transfer or validation of points. It is a fast process because the link is done using the *Bluetooth* signal strength (i.e., radio signal). Thus, it is enough for the employee's mobile to get closer to the customer for his/her identification. The employee will introduce in the system (through his/her device) the amount of points after billing the service (i.e., at the end of the service). When the customer returns to the business he or she will be able to see their upda-

ted balance, discounts, bonuses, and also rewards available. The business, through its employees' social networks and customers' social networks (if employees and customers disseminate their experiences with the business through their SNSs), may improve the company's image through the creation of e-wom, which ultimately will impact sales volume and business performance.

### 3.2. Server side

The server side consists of a special device (see figure 5) located at the place of business. This device takes little space, has low energy consumption, and is completely without noise. A thin-client from *EpaTec*: <http://www.epatec.es>

has been chosen to design the server. The operating system of the server is the 32-bit *Linux* distribution *Lubuntu v.10*. This operating system is very easy to use, freely distributed, quite efficient, and offers the possibility of using *LXDE* desktop. The server controls the installed *Android* application on either the employees' or customers' devices. The most relevant system implementation details are the use of innovative components and that it is designed to be upgraded and modified easily.

RE2 suggests to customers a connection with their social networks sites (SNSs), where they can disseminate their experiences with the business, generating electronic word-of-mouth (e-wom)

The connection, which enables the interaction between the server (figure 5) and each client (i.e., employees and/or customers), is established via radio (*Bluetooth*). Using *Bluetooth* as the communication interface, the *RE2* system allows any device (whether *Android*-based or not) send data and recover data related to the customer's consumption (the pro-



Figure 5. Hardware installed in the hospitality business

protocol used to query data is based in JSON, which consists on plain text files with a certain structure). In other words, any person that owns a mobile device, which has *Bluetooth* connectivity, may become a user of the proposed system. The employee's terminal is paired via *Bluetooth* to the customers' terminal. Via wi-fi, each terminal (i.e., employee and customer sides) updates customer data on the server. Each customer can check his/her consumption balance through the *Bluetooth* link. Figure 6 describes the main functions of the server side.

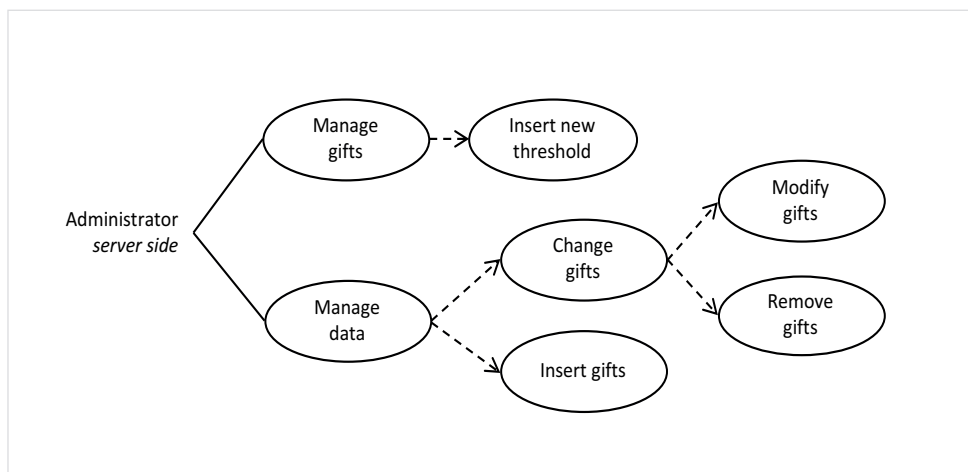


Figure 6. Server side

### 3.2.1. Description of the application of the server side

The web application installed on the server allows the business administrator to manage the general requirements for rewards and the consumption points needed for different rewards. It is included in the files available on <http://www.ual.es/~jaberme>

For more details see figure 7.

The web application has a main role called administrator or admin role. The admin has to log into the application to configure general parameters, such as the number of points needed for each reward and manage data for each customer in the database. In addition, the admin can instruct the system that a certain user has unlocked a special reward (when the customer checks his/her data, then this special reward is marked as available). The database (also installed in the hardware shown in figure 5) records all the updated information on points-to-reward from the employees' and customers' sides of the system for future reference from both sides.

The algorithmic view of the proposed system has been represented below:

### Algorithm

Input

A customer requests a service at the business

Output

Improve customer management and service quality  
Emotionally engage customers with added value  
Use customers' social networks to spread information about the business

Begin

Step 1. During the service

Identify the customer  
Update his/her consumption  
Get his/her Klout score (if available)  
Check whether the customer follows us on Twitter (if not) → Ask him/her to follow the business on Twitter  
Update his/her engagement strategy (depending on consumption and Klout)  
Unlock gift/s  
Offer gift/s to the customer  
If he/she accepts gift/s → Ask him/her to spread the experience through his/her social media networks

Step 2. After the service

Analyze how the customer spread his/her experience: get all the user's social networking interactions  
Update his/her score accordingly (i.e., depending on consumption and Klout)

End

Numero (number)	Descripcion (description)	Puntos requeridos required threshold	Imagen color color pic	Imagen blanco-negro b/w pic	Modificar modify	Eliminar remove
1	Cafe Coffee	15 15				
2	Cafe con croissant Coffee w croissant	25 25				
3	Desayuno completo con tostada Complete bfast.	30 30				
4	Desayuno completo con donuts Complete bfast. w doughnuts	40 40				

Figure 7. Web application interface

## 4. Results

In order to check the proposed system, we have randomly chosen a hospitality business located in Almería (Spain). The period of time using the solution by the business was between September and October 2014. The business used the mobile application, and a *Twitter* account with the business's name. We have identified some evidence of the benefits of the proposed solution listed below.

Regarding the profits generated by the creation of the brand image, we have included some indicators (Peters *et al.*, 2013). First, in order to measure the impact or benefit of our computer application, we chose a *Klout* score (Edwards *et al.*, 2013; Serrano-Puche, 2012). There is a direct link between the *Klout* score and the one who leaves the message. It is crucial to identify customers who have a bigger *Klout* score in order to increase the spread of the message, since the ultimate business goal is to acquire new loyal customers. In the particular case study analyzed, and after two months using the proposed solution, the business's *Klout* score raised from 0 to 43. This fact means a gain of reputation and influence on the Internet.

“The use of *RE2* by hospitality business implies the improvement of the business online reputation, and an increase in sales due to the reward system developed”

Second, with regard to the economic profits obtained by the selected business and after a face-to-face interview with the manager of the business, he indicated that there had been an increase in monthly sales (+3.3%). This increase was experienced specifically during the breakfast period every day of the week. Comparing the previous years' sales for the same month, the manager deducted that this was not a seasonal factor. Indeed, it was a clear consequence of the implementation of the reward system proposed. Furthermore, the manager indicated that the implementation of the rewards system and the use of *Twitter* had been well received by both employees and customers.

## 5. Conclusions and future developments

While the proposed hardware-software solution is functional, the current version (version 1.1) leaves room for improvements. First, useful extensions of this work would be to apply the solution in other industries (e.g., hair salons, hospitals, schools, veterinary offices) and contexts (e.g., different countries and business models) in order to compare results and find possible differences. Second, the mobile application proposed is limited to *Android* devices, and there is a need to adapt this technology to other platforms, such as *iOS* or *Windows Phone*. Third, it is desirable to integrate new functionalities to improve the visualization of customers' and employees' sides of the application, this might include more details about consumption (i.e., date, quantity, money spent in the business), and translation to other languages (*RE2* is currently available in Spanish). In addition, as a future characteristic of the software we have considered the development of a simplified customer interface to

invite not loyal customers to disseminate their business experiences through their social networks (i.e., get more functionality from simply using their *Bluetooth* connection with the system). Finally, the application uses only the *Klout* score in order to measure each customer's online influence. It would be interesting to include other measures, such as *PeerIndex* (customer's online authority), to calculate a global measure of customers' influence online (*PeerIndex*, 2009; Serrano-Puche, 2012).

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