Chapter 18
Non-Invasive Personalized In-Store Location-Based Marketing:
A Practical Use Case

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ABSTRACT

This chapter shows a practical end-to-end solution that allows the integration of noninvasive location-based marketing advertisements finally binding physical and virtual in-store customer presence. The goal of the solution is to digitalize the business and improve the customer experience with the indoor

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proximity-based iBeacon technology for personalized marketing advertising. The architecture uses cheap battery powered iBeacon devices, Android App and a recommender system for sending noninvasive advertisement in the right moment to the right customer. The intelligent combination of loyalty programs, personalized location-based marketing campaigns, and connection to existing CRM systems will enable the desirable increase in customer loyalty by also creating ideal circumstances for custom omnichannel marketing.

INTRODUCTION AND RELATED WORK

Introduction

Nowadays, numerous systems are required and implemented with the aim of manipulating large amount of information, returning results consistent with the objectives and business needs requested by several stakeholders. In personalized advertising scenario, recommender systems, make use of the large amount of data (internet searches, previously searched or viewed items, spoken words and so on…) to build highly accurate customers' profiles (Huang et al. 2019). However, this revolution, is still confined online.

This chapter shows a practical and effective solution for applying smart marketing strategies and improve in-store sales through artificial intelligence, by using recommender systems and location based services.

The following case study focuses on the study and design of a modern system, that aims at customer loyalty, through a series of personalized recommendations starting from a set of information concerning the customer: in particular, the position within an indoor environment and purchases made over time.

The main idea is to fill the gap between physical and virtual presence by creating a more comprehensive digital-physical customer profile. Like television companies that own frequencies on which to transmit, the idea is to make possible to market the "navigable digital space" by offering a network of locations for sending personalized, non-invasive, highly targeted advertising campaigns.

The objective of this study is to allow the customer to integrate location-based marketing activities in all their sales channels. The intelligent combination of digital customer loyalty programs, location-based marketing and connection to CRM and POS systems will allow the desirable increase in customer loyalty, also creating the ideal circumstances for personalized omnichannel marketing.

The scenario is the following: the customer installs the app on his/her smartphone and binds it with his/her loyalty card code. Once the customer enters within the physical store, her/his app in background scans for surrounding bluetooth beacons. If it finds some beacons, it sends this list to the web service who will provide, if relevant, a recommendation. This recommendation is transmitted to the customer's phone via a noninvasive notification. Every step is recorded for further business analysis.

The system that will be designed falls into the category of proximity systems, i.e. those systems that allow customers to be located within indoor environments (Satan et al. 2018). Their main objective is to determine the position of customers inside closed environments by measuring the distance from a sensor positioned somewhere inside the indoor environment.

The system has a client-server architecture: the client is represented by the mobile application and the server by a set of web services such as authentication, registration (contact and account), request