

Application of Beacon Technology for Enhanced Customer Engagement in Insurance Companies

Vajisha U. Wanniarachchi
Nanyang Technological University
Singapore
vajisha.uw@ntu.edu.sg

O. N. Newton Fernando
Nanyang Technological University
Singapore
OFernando@ntu.edu.sg

Yohan Fernandopulle
Nanyang Technological University
Singapore
Yohan.F@ntu.edu.sg

ABSTRACT

Enriched customer engagement is an inevitability when considering an enormous growth of every industry, and certainly, insurance is not an exception. With the rapid development of digital technologies and competitiveness between companies in the same industry or with alternative industries, businesses tend to excite their customers to obtain the competitive advantage. Conversely, with the understanding of the competitiveness of businesses, customers change their expectation and demand for a better service and engagement. As a result, digital technologies such as Bluetooth Low Energy Beacon technology overruled the existing methods of customer engagement. Though there are a lot of businesses which have adapted beacon technology to enhance customer engagement, there is lack of evidence of its adaptation in the insurance sector. Therefore, this paper aims to use beacon technology to enhance the customer engagement in insurance companies.

CCS CONCEPTS

• **Information systems** → **Enterprise applications; Mobile information processing systems;** • **Human-centered computing** → **Human computer interaction (HCI); Ubiquitous and mobile computing systems and tools; Ubiquitous and mobile devices;**

KEYWORDS

Bluetooth Beacon, Mobile application, iOS, Android, Insurance

ACM Reference format:

Vajisha U. Wanniarachchi, O. N. Newton Fernando, and Yohan Fernandopulle. 2017. Application of Beacon Technology for Enhanced Customer Engagement in Insurance Companies. In *Proceedings of SA '17 Symposium on Mobile Graphics Interactive Applications, Bangkok, Thailand, November 27-30, 2017 (SA '17)*, 3 pages.

<https://doi.org/10.1145/3132787.3139207>

1 INTRODUCTION

The business world shows a fast and a radical change in past few decades especially with the rapid growth of information technology. According to Westerman et al. [Westerman et al. 2014], existing businesses face a wave of innovations in a large scale which has not

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

SA '17, November 27-30, 2017, Bangkok, Thailand

© 2017 Copyright held by the owner/author(s).

ACM ISBN 978-1-4503-5410-3/17/11.

<https://doi.org/10.1145/3132787.3139207>

been seen since earlier industrial revolutions. The rapid growth of innovative digital technologies affects the companies beyond their borders [Matt et al. 2015]. The companies which adapt the novel technologies gain a considerable competitive advantage over the ones which fail to integrate them into their businesses [Liu et al. 2011]. The affect occurred by the digital technologies caused a digital transformation in the business world. This digital transformation pressurizes companies to develop and integrate cost-effective digital technologies, and as a result, customers tend to change their expectations towards these companies. Treacy and Wiersema [Treacy and Wiersema 1993] argue that companies can create value in three different disciplines as operational excellence, customer intimacy and product leadership. Though these disciplines are equally important, this research focuses on enhancing customer intimacy using an existing and highly used digital technology. According to Westerman et al. [Westerman et al. 2014], there are four ways in which companies can transform the customer experience:

- (1) Understanding customer behavior and designing the customer experience from the outside and in.
- (2) Increasing reach and engagement.
- (3) Putting customer data at the heart of the customer experience.
- (4) Seamlessly meshing the physical and digital experiences.

Creating an environment which has rich interactions and communications, and targets to approach the customers in these four ways results in satisfied customers. Customer satisfaction is crucial, especially for the insurance industry. Therefore, adopting digital technologies to create rich interactions and communications especially inside the company premises would deliver the message of how important and welcomed each customer is.

Beacon technology has become one of the technologies which can be a part of the present digital transformation. They can be used for purposes varies from proximity-based event triggering to working sensors [ANDERSSON and SÄRNQVIST [n. d.]]. GPS satellites can be considered as an example for beacons which calculates a device's position and altitude relative to earth. Yet, GPS is well-suited for outdoor environments since it needs a clear view of the sky and has limited energy usage. Therefore, location services which are solely based on GPS technology do not perform well in indoor environments. Also, their performance can be affected when the service runs from the background because they consume too much energy. Though beacon technology is a widely used digital technology to enhance customer interactions in various platforms, there is lack of evidence of its usage in insurance companies. Therefore, this project investigates on ways to use beacon technology in the insurance sector and aims to facilitate insurance companies to identify each customer who has stepped into the company's

headquarters and provide personalized services to each identified customer.

2 RELATED WORK

Beacons are generating a massive market trend since 2013 when Apple [apple [n. d.]] introduced iBeacon Technology [Augur 2017; Maycotte 2015]. The implementations of beacon technology were initially begun by the retail sector. One of the earliest adaptation of the technology at a large scale was the American fashion retailer Macy's [Macys [n. d.]]. They deployed 4000 beacons in 786 stores all over the U.S. in 2014 [Halzach 2014] to send messages to the customers who are in the stores. U.S. Major League Baseball (MLB) [MLB.com [n. d.]] also located beacons inside the stadiums to push tailor-made notifications and offers to their fans who had checked in at the stadium [Gorman 2014]. Beacons were also used to feed real-time updates of queue lengths for attractions in an amusement park [Boden 2016]. Therefore, it is evident that the application of beacon technology is not only limited to one sector. Though the current insurance sector seems to embrace digital technologies for customer-centric innovations, the adaptation of beacon technology in insurance companies is yet to address.

3 PROPOSED APPROACH

After investigating the ongoing process when a customer steps into the company premises, this project proposes a method to identify the customer from the main door and inform necessary parties of the company about his/her arrival.

The proposed solution categorizes the company premises into different regions. The beacons will be located in each region. These beacons are used for triangulating with moving beacons to increase the accuracy of the indoor positioning. Each customer and insurance agents will be given an ID card which has a BLE (Bluetooth Low Energy) beacon stickers. When a customer enters to the company premises with the ID card, the system identifies the customer, and customer care officers can find all the necessary information about that particular customer (see Figure 1). The system has two major components: a web application, and a mobile application. The integration will be handled by a message queue (MQ) server (see Figure 2).

3.1 Mobile Application

The mobile application is only available for Android phone with BLE support. It acts as the BLE beacon detector. The region details and sensing range downloads before the beacon scanning phase. Estimote Android SDK is used to detect nearby beacons. After detecting beacons which are located within the sensing range, they are prioritized according to the estimated distance from the detector to BLE beacon. An AMQP (Advance Message Queuing Protocol) message is created with the nearest beacon's details including beacon ID, major value, minor value, estimated distance and signal strength. Then it will be sent to the MQ server.

3.2 Web Application

The web application consists of two main user roles as administrator and staff member. The administrator can register users, assign insurance agents to the customers, create beacon regions

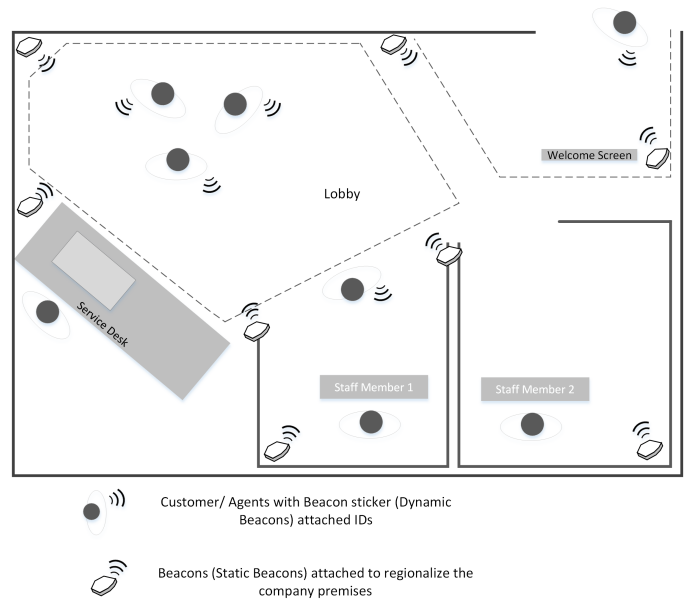


Figure 1: Floor plan of the company premises after installing the proposed approach.

and edit beacon details (see Figure 3). Each beacon is mapped with a customer or an insurance agent.

When a customer stepped into the company premises, the staff member of the service desk receives the selected details of the approaching customer. The service desk can locate a kiosk near the counter to display an auto-generated and personalized greeting message when a customer is approaching the service desk. The staff member in the service desk also can greet to the customer without enquiring the customer's identity. Service desk staff can also view the customers who are waiting inside the selected region. All the necessary information will be loaded to the dashboard (see Figure 4), and staff members can find the necessary details to serve the customer with minimum steps.

This application developed using Node Js and used MEAN framework stack. Details of users and agents are saved in Mongo Database server.

Rabbit MQ server is used to integrate mobile application and web application together. A separate MQ channel is created in MQ server, and AMQP message is inserted into the respective queue.

3.3 Conclusion and Future Works

The paper suggests a relevant application of beacon technology in insurance sector to improve the customer engagement within an insurance company and reduce the waiting time. The proposed application consists a mobile application which detects the beacons and a web application which displays information relating to the detected beacon.

Currently, the beacon footprints are saved in a database. These data can be used to perform data analysis to increase the customer engagement further. The analysis can be performed on customer movements to identify which region caught customer's interest

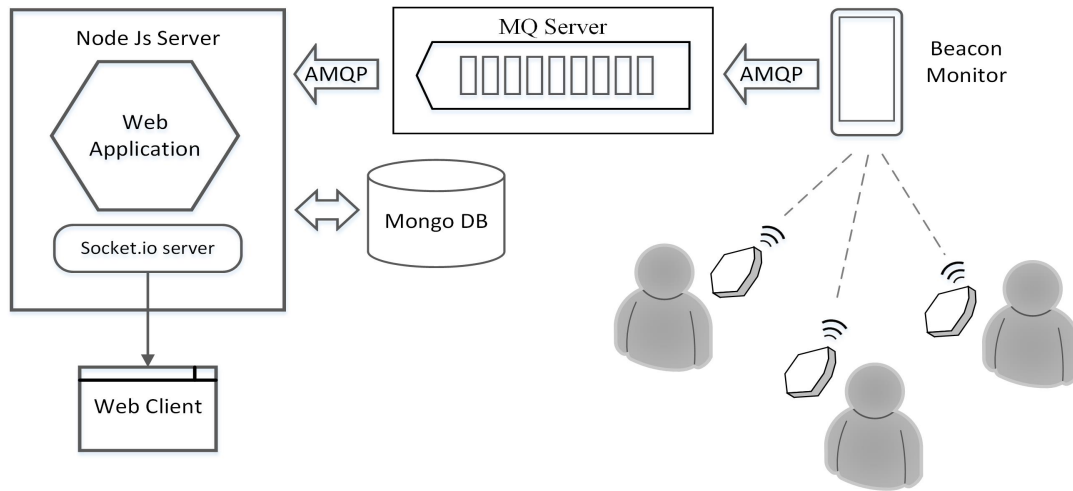


Figure 2: System Overview

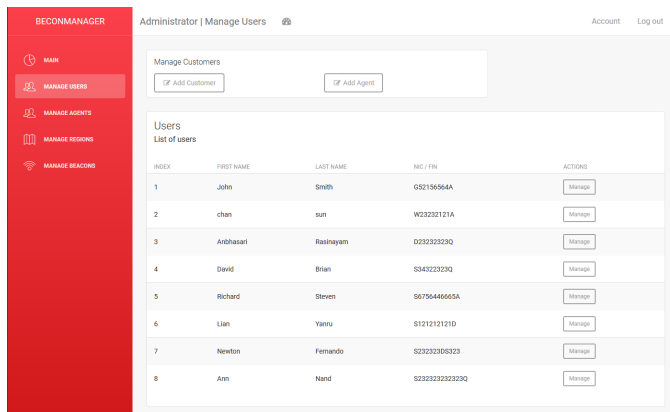


Figure 3: Administrator's Page.

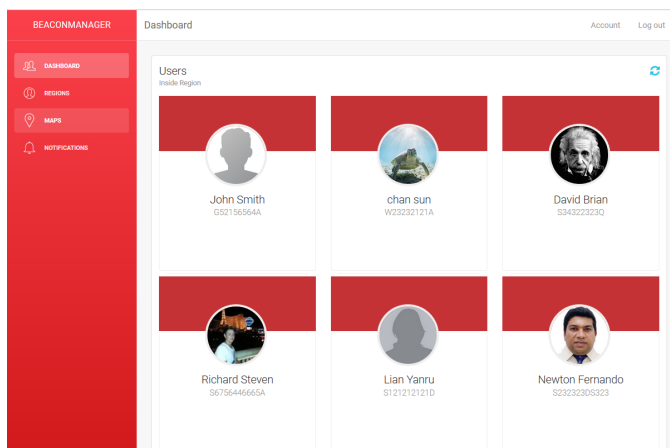


Figure 4: Dashboard of the web application.

mostly. With this information, the system can be further enhanced with a customer based mobile application to introduce new insurance policies, benefits of the policies, tips for a good lifestyle, etc.

Though the proposed approach tested its performance in a regionalized indoor environment, a usability study and a user evaluation are yet to be executed.

REFERENCES

ANTON ANDERSSON and CATHRINE SÄRNQVIST. [n. d.]. Mapping Business Opportunities in the Light of the New Bluetooth Beacon Technology. ([n. d.]). apple [n. d.]. Apple.Inc. ([n. d.]). <https://www.apple.com>

Hannah Augur. 2017. Beacon Technology 2017 Forecast: 7 Experts Share Their Thoughts. (2017). <https://kontakt.io/blog/beacons-2017-forecast-7-experts-share-their-thoughts/>

Rian Boden. 2016. Swedish amusement park installs BLE beacons. (2016). <https://www.nfcworld.com/2016/03/01/342814/swedish-amusement-park-installs-ble-beacons/>

Michael Gorman. 2014. San Francisco Giants (and Most of MLB) Adopt Apple's iBeacon for an Enhanced Ballpark Experience. *Endgadget*, March 28 (2014).

S Halzach. 2014. Is the New Technology at Macy's Our First Glimpse of the Future of Retail? *The Washington Post* (2014).

Day-Yang Liu, Shou-Wei Chen, and Tzu-Chuan Chou. 2011. Resource fit in digital transformation: Lessons learned from the CBC Bank global e-banking project. *Management Decision* 49, 10 (2011), 1728–1742.

Macy's [n. d.]. Macy's - Shop Fashion Clothing and Accessories - Official Site. ([n. d.]). <https://www.macys.com>

Christian Matt, Thomas Hess, and Alexander Benlian. 2015. Digital transformation strategies. *Business & Information Systems Engineering* 57, 5 (2015), 339–343.

H.O. Maycotte. 2015. Beacon Technology: The Where, What, Who, How and Why. (2015). <https://www.forbes.com/sites/homaycotte/2015/09/01/beacon-technology-the-what-who-how-why-and-where/>

MLB.com [n. d.]. The Official Site of Major League Baseball. ([n. d.]). <https://www.mlb.com>

Michael Treacy and Fred Wiersema. 1993. Customer intimacy and other value disciplines. *Harvard business review* 71, 1 (1993), 84–93.

George Westerman, Didier Bonnet, and Andrew McAfee. 2014. *Leading digital: Turning technology into business transformation*. Harvard Business Press.