IPS technologies in sales improvement in companies in Banja Luka, Bosnia and Herzegovina

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Abstract. Modern economy, in first order Retail sector, are introducing new and modern technologies which improve sales, communication with customers as well as marketing decision process. Retail sector is more and more oriented to technologies which improve not just communication with possible customers but also information gathering for better decision making process. Among those technologies special place is given to Indoor Positioning Systems (IPS) technologies, specialized technologies which are used for locating the people and objects but also their movement as well as for communication with clients in the store. These technologies follows customers in the store, follow their movement across, communicate with them about offers and promotions but also are base for predictive marketing of retail sector which has a goal to achieve „offer to customers what they look for and what they really need“. These technologies are in limited usage in Banja Luka area but potential for their use is present. There is no enough demand from retails industry but having in mind that these technologies are raising in modern economies as well as predictions and trends it is to be expected that those technologies will be implemented in retail sector in this region too.

1. Introduction
Retail sector is in continuous demand for the new strategies of communication with clients, as well as for new technological gadgets for business intelligence improvement and finding valid information for better strategic and operational planning. Considering technological improvement in modern society, the expectations are that new technologies are going to immerge in retail sector. IPS, which contains the whole set of technologies for locating the customers in the store, their interest in offers, specialized technologies for personalized communication has a specific role in retail industry. Among IPS technologies, the great importance is given to beacon technology which is based on the small devices called beacons that transmit specific messages using Bluetooth Low Energy (BLE, which is different from the first version of Bluetooth) when the person or, more accurately, the device that has the reading compatibility of BLE broadcasting signal is on particular distance. The technologies mentioned above, with all its advantages, are becoming the basic technological gadget for obtaining the information that serve as a basis for analysis through business intelligence system, especially considering the sales analysis, heat maps analysis i.e. the map of customers movement through the store, location of products analysis as well as sales improvement which are enhancing customers’ loyalty and supporting Customer Relationship Management (CRM) systems [1], [2].

The main hypothesis of this paper starts from the fact that the IPS technologies application in retail sector will increase whereas their benefits are going to bring great influence on the currently unknown
changes of retail sector. These IPS technologies are likely to have the same destiny of rejection as other similar technologies from the past (such as usage of consumer card in retail sector) in our countries. However, these technologies were, subsequently, also implemented in our countries because of the benefits they have and influences from well-known leading companies.

The first part of this paper gives an overview of the main terminology and phrases used in IPS technologies with the focus on beacon technology as a most important IPS technology. Furthermore, there is a brief review on the global leading research of application of these technologies in retail sector as well as predictions for the future. In addition, there is an overview of functionality and potential benefits of application of these technologies in retail sector and on the other sectors where these technologies might be used.

The second part of this paper reveals the results of the research which was conducted in Banja Luka through anonymous questionnaire of participants who are greatly experienced popular personnel of this industry. The individuals who completed the questionnaire were the directors of retail companies and chains, stores’ managers and well experienced traders with specialized skills. The purpose of this questionnaire was to identify the level of awareness that these individuals have about IPS technologies, their commitment for eventual application of these technologies in their stores, their opinion about the time frame these technologies would take to improve the retail sector, their evaluation of level of customer interest for these technologies in our countries even when the potential benefit for customers is evident.

2. Indoor Positioning Systems (IPS): definition of technologies, relationship with retail sector and global trends of implementing this technology

The easiest way to define IPS is to describe it as a GPS for indoor environment (the reason for this relation is the fact that usage of GPS in indoor environment is impossible or nearly impossible). The technologies mentioned above are frequently used for location of people and objects through the use of mobile devices, such as smart phones or tablets. IPS often relies on technologies such as beacon devices, as well as on Wi-Fi technologies using magnetic positioning, sometimes geomagnetism, video technologies, GMS/3G/4G, compass technologies, etc. However, the most frequently adopted technology is beacon technology which is based on Bluetooth low energy (BLE) that enables not only customers’ location and their movement in the store, but also sending specialized messages and offers received through analysis of customers’ entering and movement through the store and their earlier interests in particular products and purchases [3], [4].

The benefits of using this technology for Retail Company or chain are [5], [6]:

- Identification of entering the store
  1. Gaining passerby attention
  2. Keeping track of customers entering the store and replacement of the consumer card

- Finding the products and navigation through the object
  3. Sales improvement through finding the desirable products easier
  4. Improvement of movement through the store via linking the shopping list with products’ location in the store

- Sales employees’ efficiency improvement (receiving less customers’ inquiries)
- Enabling customers to contact sales personnel through the use of application which brings customers’ satisfaction

- Targeted advertising
  1. Additional promotional channel
  2. The possibility to offer connected products
  3. The possibility of getting the personalized coupons for individual customers
  4. The possibility of offering the replacement for products
  5. The chance of receiving the payments from particular brands

- Interaction with client
  1. Online support for customers and stores’ visitors
2. Receiving the customers’ impression, comments and recommendation from customers. Moreover, the potential benefits that customers and visitors in the store are receiving should also be identified and considered. These are listed below:

- The identification while entering the store
  1. Getting the information while entering the store (or in front of the store) about the current specials etc.
  2. Receiving the notification that the certain store is nearby (as customers may not notice the location of the store, so they get informed).
- Searching the product and navigation in the store
  1. Quick search through the store
  2. Navigation and movement through the store
  3. More information about the product, online recommendations etc.
  4. The chance of communicating with sales personnel via application
- Targeted advertising
  1. Adjusted targeted push-notifications
  2. More attractive personalized offers
  3. Advertising and informing the customer only about the products which are of client’s interest.
- Interaction with client
  1. Chance of getting an online support
  2. Possibilities to leave the impressions, comments and recommendations as well as to read other customers’ experiences

These technologies also offer particular benefits for the brands which are:

- Having the potential of giving more information about the products
- Offering the possibility of additional advertising, especially through push-notifications
- More focused promotion (ex. advertising the customers’ who expressed the interest)
- Direct communication with clients
- Collecting customers’ impressions, critical views and suggestions about the brands.

These technologies are used through the particular application and they have some long lasting benefits which are presented in the tables below.

**Table 1** – Positional benefits of IPS technologies implementation for different beneficiary groups (authors contribution)

| Retail                              | Brands                                | Customers                                    |
|-------------------------------------|---------------------------------------|----------------------------------------------|
| Sales promotion (through the support in finding products) | Additional channels for brand promotion | Efficiency in purchasing and time saving |
| Customer loyalty is at higher level | Direct channel for communication with customers | More information about products and recommendations |
| Building more powerful channels in order to offer products, substitutes, | Possibility of providing additional information about product | Aimed offers and discounts based on customer's location |
The importance of using these technologies is greatly evident through its analysis. The application of these technologies offers certain advances for each of targeted groups. This gadget is becoming enormously useful analytical gadget as it is enabling the following:

- Customers’ movements through “heat maps”, display of their movement and the customers’ stay
- Customers’ behavior analysis and their reaction to special offers
- Informing the brands, which are on offer at the store, for the purpose of sales’ analysis

Furthermore, these analyses of application are also useful for the brands as they provide the information about the customers’ movement and reactions as well as about the effects of promotional campaigns that are focused on targeted customers.

These analyses allow the positive effects for sales which includes optimal organization inside the store, optimal placements of products that belong to same category as well as optimization of special offers through the observation of its efficiency. Moreover, this is one of the ways for the sales chains to offer the additional promotional channel to its customers and brands which allows the sales chains to get the special offers when purchasing the products or selling the promotional place. In addition, these brands can be offered the sale of analytical reports and customers’ behavior through specific segments, effects of particular promotional campaigns as well as the information about the activities of competitive brands inside the store [7].

The application of this technology can also have positive effects on business organization through employees’ efficiency analysis, reduction of excessive activities which can be replaced with more efficient and useful application as well as through the observation of employees’ movements throughout the store and their adherence to the stores’ policies and procedures. Ultimately, the same technology can be used for sending the messages and workplace communication which can have positive effects on costs reduction and time management.

Swirl Networks Inc. [4] report emphasizes that 73% of customers believe that their chances to buy the product would be greater if they receive the message, special offer or information about the desired product. It follows that this percentage would even increase if, through the particular system of business intelligence, these customers receive the special offers based on their previous visits to the store, their requests for information, previous purchases, movement throughout the store etc. The same report suggests that 60% of the customers would rather receive the information about the products and offers which was sent through beacon technology whereas 30% of these customers are already receiving these notifications. 61% of customers that took part in this research state that they would rather visit the store that has beacon technology system in place than the store that does not have that while 60% of customers believe that they would shop more if they receive offers through beacon technology.
Cooper Smith, in the report „THE BEACONS REPORT: Growth Forecasts for The Most Important Retail Technology since the Mobile Credit Card Reader” claims that 100 leading retail chains in USA are trying out the beacon technology [8]. According to these findings, the question of the size and influences of beacon technology come into consideration. The same author points out that, beacon devices are “the fastest growing devices which are used for retail stores since credit cards” [8].

Some of his interesting findings related to development of the application of this technology are:

- The number of installed beacons is expected to be over 4.5 million until the end of 2018, from which 3.5 million are going to be installed in retail stores
- It is believed that up until the end of 2015. more than 1/3 of leading retail companies already had beacon devices installed
- It is globally believed that more than 570 million devices, whether Android or Apple OS are compatible with the use of Bluetooth low energy which certainly makes this technology extremely attractive as a tool for new communicational channel with customers.

Some of the leading retail chains, particularly in USA have a considerable usage of this technology. The examples of this usage are seen among the retail chains of Macy’s stores such as Target, Lord & Taylor, Walgreen’s as well as the well-known retail chain of technical equipment such as Best Buy’s which has the beacon technology in place for considerable length of time for the purpose of sales improvement and better communication with clients and visitors. All of these findings are suggesting that this industry is increasing and that the percentage of those using beacon technologies is going to have considerable growth until the level when this technology will be expected in the stores. The application of beacon technology is also evident in other sectors. For instance, the art centers are using this technology to transmit messages and information about the art work exposure. There is an obvious usage of beacon technology in transport as it is used for navigation, information and promotion around the bigger places for transport including airports, harbors, vast train stations etc. Some of the health departments and educational institutions which are greatly developed are also using this technology. Furthermore, these technologies have their existence on special occasions, such as concerts, movie spectacles and music festivals etc.
3. The results of the research “Analysis of attitudes related to the implications of IPS in retail sector in Banja Luka”

In the period of March-May 2016 a research was conducted in Banja Luka on carefully chosen participants working in sales stores who completed an anonymous questionnaire. There were 34 well-known experienced individuals of this sector in 12 retail stores participating in this research. These participants were selected directors of retail companies and chains, stores' managers and well experienced traders with specialized skills.

The aims of this research were:
- Estimating the level of knowledge participants have about IPS technologies
- Evaluation of participants’ interest and commitment to commence the implementation of these technologies
- Analysis of participants attitude and opinions about eventual benefits that these technologies have and their effects on sales’ improvement

There is the list of questions and results summarized on the basis of participants’ answers.

![Figure 2. Answer to question “Are you familiar with Indoor Positioning Systems (IPS)?”](image)

It is evident that majority of participants is not aware of IPS terminology which represents a foreign phrase for them. The reason we can find in a few facts. First of all is an official education in the high schools and faculties. Our education system doesn't follow the new trends in IT technologies and retail. The second one is unofficial education. Retail companies don't spend resources on training and education their employees with news in the sector. Also, employees don't want or don't have a time, money and so on to spend on education or not interest to keep track of new trends in their sector.
**Figure 3.** Answer to question “Have you already used any type of technology which would enable you to locate and/or to follow customer movement in the store?”

According to participants’ responses it can be concluded that retail stores in Banja Luka is still not using any technologies for observing and locating customers in the store, which is one of the main indicators that business analysis and observing the behavior of customers in our countries is not given enough attention.

**Figure 4.** Answer to question “Would you support initiation of technology which would enable you to monitor customer's movement in a store and the time it spends at the certain positions/locations?”
On the other hand, 65% of participants support the idea of implementation of technology which would enable observation of customers’ movement inside the store as well as their continuous stay in the particular place of the store. Even more participants, nearly 80%, would support the implementation of technology which enables sending the specialized messages to customers while in the store. This confirms the idea that participants in this study realized the fact that this way of communication would be useful for sales’ improvement.

**Figure 5.** Answer to question “Would you support initiation of technology which would enable you to send specializes messages to customers when they are moving through a store?”

The participants also recognized that this technology would have a positive effect on increase in the sales, which is the main indicator of the success of retail store or chains. In addition, more than 60% of participants believe that these technologies would have a positive effect on enhancing customers’ loyalty which is, strategically explained, significant indicator of quality of these technologies.

**Figure 6.** Answer to question “Would such applications have an effect on sales growth?”
It is well known that people don't adapt new technologies so easily. Especially when they don't know anything about advantages or disadvantages of a new application and they not tried it. Authors are opinion this lack of information had an impact on participants answers.

According to the last population list in Bosnia and Herzegovina lives 3,53 million of people and this is not a big market. There is also a question of profitability of introducing this type of technology in so small and purchasing possibility low market.

4. Conclusion
IPS technologies, especially beacon technology is globally known by the retail sector. Their implication is constantly becoming greater and its effects are evident. There is an increasing number of retail chains, particularly in USA, which are using these technologies for decision making processes as well as for new communication processes. On the other hand, the customers are also finding the benefits which have a positive effect on their willingness to use these technologies.

This paper identifies significant benefits for retail companies of using IPS technologies. Through interaction with customers, retail companies can find out what customers want, what they look for, are they satisfied with offer etc. Based on this information retail companies can direct efforts to optimize the time, costs and efforts of customers and own employees. Lack of time for shopping today is a common feature of a significant number of customers. The most important benefits of using IPS technology for customers are spending less time and money to buy what they need. Personalized offers based on customers preferences, better customers experience, and optimized movement through the store. According to the different research, customers have a positive reaction to use IPS app. IPS technologies can make a significant impact on the brands in store, business organization, and CRM, also. IPS is found its place in a lot of different areas: in museums, warehouses, concerts, events, to find an office in buildings etc.

The local retail sector in Bosnia and Herzegovina is still not aware of the terminology related to IPS technology or the technology itself. Regardless of the fact that local retail sector is not yet implementing these technologies, there is a positive attitude towards potential benefits on sales’
improvement. Nevertheless, these technologies are going to be implemented in local retail companies despite the local interest in them, whether through the local or international retail chains. Furthermore, taking into consideration growth rate of implementation of these technologies and welcoming them by the customers and retail sector, it is unquestionable that these technologies will become integral part of individual purchases and strategic marketing management of retail chains.

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