

BonAir: Making Sense of Big Data with a unique IoT based advanced analytics solution

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Introduction

In recent years, the increasing importance of “big data” has also led to “big” expectations. Particularly with the introduction of the concept of Internet of Things (IoT), each object is linked to the internet and with the continuous increase in mobile and digital applications and services, data has been gathered at a surprising rate from various sources. When used and evaluated correctly, data has become a crucial competitive weapon, so in the technology world, data is frequently expressed as “new gold”. So far, the most referred reference to “big data” and objectively one of the best definitions has been made by Duke University Professor Dan Ariely: “Big data is like teenage sex. Everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it... [1]”.

Indeed, while each and every company continues to aggregate customer data, few of them can use such data to improve customer relationships and create customer satisfaction. The truth is that data does not represent a value by itself; “value” is formed as a result of processing data to solve a unique problem or fulfill a need [2].

Big Data needs to be systematically developed

Big data has not been used enough to differentiate businesses and offer new and innovative value propositions till now. Rapid analysis and interpretation of data has become more and more important every day to create value and gain valuable information. In order to obtain meaningful and useful insight from “big data”, businesses need to develop systematic processes based on their business processes. Although the methods and channels can be differentiated, it is quite critical to follow these three steps for “big data” processing [3].

- to determine the channels through which the data will be collected and stored
- to make sense of the data based on customer behaviors and create actionable insights via special algorithms and analyzes
- to provide easy-to-understand and useful reporting for business needs

Role of “Big Data” in customer communication

Appropriate use of data is also very important in order to find out strategies that will increase revenues by understanding and analyzing the customers or that will provide new customer acquisition methods.

So, an additional step can be added to the above methodology [4]. Interaction. Through interaction, companies can communicate with the customers by transmitting personalized messages in the right place, and at the right time.

Increasing importance of “predictive” analysis

In order to increase revenues, it is also necessary to be able to predict customer expectations, behaviors and reactions. To do this, data must be parsed, examined in a personalized manner, and processed as jeweler’s rigor. By analyzing the past behavior of a customer, it is possible to understand how to react in similar processes, which is called predictive analysis. It is necessary to analyze the data as it is in the series of Fibonacci ((1, 2, 3, 5, 8, 13, 21, ...)) each number is the sum of the two preceding numbers); analyzing previous steps to predict approximately exactly what the next step will be [5].

Improvement of Customer Experience

The omni-channel strategy is becoming increasingly important, and companies are trying to move into multi-channel structures to communicate with customers and maintain a balance between the traditional and digital channels. This balance of Big Data is very useful in order to guide organizations in terms of reaching the customer with the preferred channel. It is also necessary to use more of the big data to improve the inter-channel customer experience, hence gain a competitive advantage [6].

With Bonair, we make sense of Big Data

Bonbon Technology is a new generation technology company by design and a next generation IoT company at heart with the aim of using data in the most efficient way that will give rise to increase in profits. With Bon Air, the flagship solution of Bonbon Technology, we try to solidify all big data trends to uncover the potential of big data and lead to provide competitive advantages for our clients.

BonAir - New Generation Retail Analytics

We aim to bring extra value to businesses with BonAir. We believe that we make sense of big data by analyzing the data collected from customer visits, customer behaviors and customer profiles.

BonAir is a disruptive technology innovation that understands and analyses in-store customer behavior (wait time, service time, visit frequencies etc.) without being connected to any wi-fi, or open

Bluetooth or without having a smart phone application. With its unique technology, BonAir aims to perform real-time behavior-based analysis. Based on their needs, customers can be directed at the right time to the right location with an 'optional' app integration as well.

Data Collection

Data is collected from wi-fi mode-on mobile devices at the locations, where Bonbon sensors have been deployed. It is sufficient that wi-fi mode is ON in the user's device. Customer data is collected without being connected to any wi-fi.

Data Processing

Various behavioral data is extracted and classified in detail with special Bonbon analysis and algorithms. With its special algorithms, it is easy to pinpoint locations of customers.

Data Reporting

Customized reporting with best-in-class dashboard is provided to each customer. Different analysis can be prepared based on customer and employee needs. We analyze behavior and process realistic business data via heat maps.

It is also possible to interact with customers bundling location based campaigns via push notifications.

BonAir Product Features

- Device Agnostic Passive Data Tracking: All data coming from customers' Wi-Fi enabled devices (independent of their brands and models) are analyzed in detail by means of BonAir sensors deployed at the partner locations.
- Application Agnostic: No mobile application is needed for reporting the location and moving pattern of the customers.
- Real-time Analysis and User Friendly Dash Board: A dashboard is provided that is designed with best-in-class user experience, where customer movements are viewed in real time, campaign effects or specific time intervals are tracked, real-time heat maps are formed and monitored.
- Heat Map: The intensities of in-store visits are analyzed based on the factors like campaigns, special event days, display windows.
- Dynamic Data Query: Authorized users can easily change data queries and data classification in order to carry out diverse and detailed analysis.
- Remote Sensor Management: Remote management of installed sensors and notification about the sensor status.
- Employee Tracking: Employee badges are digitalized and employees are tracked based on their working hours with an integration of customers' HR systems.
- Segmentation: detailed and need-based customer segmentation is provided based on data such as customer behavior, the brands and models of the devices, visiting and expending frequencies etc.
- Real-time Direct Marketing: By integrating with the mobile applications, profile based messages are sent to customers at the right time, at the right place.
- Branch Efficiency Comparison and insight for branch openings / closings: Detailed comparisons based on branch efficiency can be provided with different parameters and analysis can also be used to determine new locations for opening up new stores or closing inefficient branches.

- Free wi-fi: With BonAir devices, free wi-fi support can also be offered to the customers.

Bon Air Implementation

- System Based on scalable, sustainable micro-services.
- Connection between microservices are done by MQTT [ref{https://en.wikipedia.org/wiki/MQTT}](https://en.wikipedia.org/wiki/MQTT).
- When a probe request received, it is processed by BonAir Algorithm's.
- Raw Data calculated after processed through Mac Randomization Defeat Algorithm [ref{https://hal.inria.fr/hal-01330476/document}](https://hal.inria.fr/hal-01330476/document), Distance Calculator Algorithm [ref{www.indjst.org/index.php/indjst/article/download/94675/70032}](http://www.indjst.org/index.php/indjst/article/download/94675/70032) and Trilateration Algorithms [ref{https://en.wikipedia.org/wiki/Trilateration}](https://en.wikipedia.org/wiki/Trilateration).
- After Raw Data saved to Database, via API and Sync Services, data is published to Dashboard.
- Main Infrastructure contains MongoDB [ref{https://en.wikipedia.org/wiki/MongoDB}](https://en.wikipedia.org/wiki/MongoDB), Elasticsearch [ref{https://en.wikipedia.org/wiki/Elasticsearch}](https://en.wikipedia.org/wiki/Elasticsearch),

NodeJS [ref{https://en.wikipedia.org/wiki/Node.js}](https://en.wikipedia.org/wiki/Node.js),

PHP [ref{https://en.wikipedia.org/wiki/PHP}](https://en.wikipedia.org/wiki/PHP),

MQTT [ref{https://en.wikipedia.org/wiki/MQTT}](https://en.wikipedia.org/wiki/MQTT),

nginx [ref{https://en.wikipedia.org/wiki/Nginx}](https://en.wikipedia.org/wiki/Nginx),

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