INTERNET OF THINGS (IoT): APPLICATIONS IN MAREKTING

T. Mallikarjuna Raju[1], Dr. G. Chandra Sekhar[2]

[1]Research Scholar, Department of Management,

Rayalaseema University, Kurnool, (India)

[2]Professor & Director, School of Management Studies,

Joginpally B,R. Engineering College, Hyderabad (India)

ABSTRACT

Connectivity in the digital age has broader meaning than simply putting two or more people in touch and internet creates a platform for information sharing, collaboration, and commerce. Devices interconnected through internet and interacting capability are called as Internet of Things (IoT). Organizations developed new business models using the huge volumes of data generated through the interconnected machines using IoT platforms and adding value to the stakeholders. This paper lists out the major IoT platform vendors and how different industry verticals are leveraging IoT technology for offering innovations to their customers in marketing areas like customer relationship management, customer experience, product design, product service, sales tracking, and predictive analytics. Finally this paper discusses the challenges and issues in adopting IoT technology in organizational processes.

Keywords:Customer Experience, Customer Relationship Management, Internet of Things, Predictive Analytics, Product Design.

I. INTRODUCTION

Gates, B. (2003) in his book Business at The Speed of Thought mentioned that connectivity in the digital age has broader meaning than simply putting two or more people in touch and internet creates a platform for information sharing, collaboration, and commerce. In the Harvard Business Review webinar titled Competing in the Connected Economy (2016), it is stated that "In the Connected Economy, value is created through the technology-enabled links between people, machines, and organizations". Devices interconnected through internet and interacting capability are called as Internet of Things (IoT). According to the Business Intelligence report on Internet of Things (2017), it is estimated that by 2020 there will be more than 24 billion IoT devices and $6 billion will be invested for the IoT solutions development with estimated revenue of $13 trillion by 2025. The major players in offering IoT platforms are Amazon Web Services, Microsoft Azure, IBM's Watson, Cisco IoT Cloud Connect, Salesforce IoT Cloud, GE Predix, ThingWorx IoT Platform, and Oracle Integrated Cloud. Organizations are developing new business models using IoT connectivity and data by leveraging the IoT platforms. Some organizations successfully developed new business models by transforming billions of customer data points which enabled them to beat the competitors. Huge amounts of data generated through the

IoT applications can be processed using Big Data technologies like Predictive Analytics to optimize the operations in the areas of customer relationship management, customer experience, product design, product service, sales operations, and consumer behavior by the marketers. This paper examines how IoT technology is implemented in Marketing functional area in different industry verticals like automobile, hospitality, retailing, consumer durables, beverages, and industrial machinery to create value for the stakeholders.

II. IoT APPLICATIONS IN MAREKTING

Customer Relationship Management (CRM): Traditional CRM operations use face-to-face and telephone contact. These direct and indirect communications are often complex passing among the manufacturer and customer, retails staff, sales, service, and marketing departments. IoT has changed the scenario by sending the customers information automatically to the CRM platform in realtime which enables the organizations to understand the customers in a whole new way. Following are the some examples of possibilities using IoT.

- How and where the customers are using the purchased products?
- What they are using with them?
- Whether the products are working properly?

Social CRM: Toyota has developed Toyota Friend platform using Salesforce App Cloud which connects the Toyota's Cars to use social networks to communicate with their owners. For example this platform sends alerts to the customers twitter account when key maintenance tasks are due. This platform also provides a dedicated social networking community for Toyota owners which enable them to interact with their cars, and dealers. This tool can also used to communicate with friends and family by connecting to the public social networks like Facebook or Twitter.

Customer experience: Using IoT marketers can measure the entire gamut of customer's experience. For example Retailers can gather customer's behavior data like time spent in the store, what product categories they observed, what products they purchased in the store. Using this data marketers can optimize the marketing communications. Disney using Magicbands wristbands device allows the customers to access the plans and vacation choices as a part of My Disney Experience. Disney tracks the customer's locations through this device in realtime and sends the customized offers to their smart phone app My Disney Experience.

The Wynn Las Vegas hotel is planning to use Amazon Echo device in all of their hotel rooms to track the customers preferences like room temperature and wake-up times, what genre of music they are listening for developing customized customer experiences.

Product Design: Whrilpool is using sensors embedded in connected appliances like washing machines, dishwashers, and ovens to collect the usage patterns of the appliances through the IBM Cloud. Using this data Whirlpool analyzes the customers product usage patterns to customize the future designs that match with the customers' requirements.

Product Service: Since connected products can generate and communicate data on their status, it is easy to find the data like how and when the equipment is used. Whenever a issue is detected connected equipment can automatically send alerts, thus helping the service department to troubleshoot the problems quickly. Sandvik Coromant planned to provide instant feedback for optimizing their assembly line cutting tools to its customers. Sandvik Coromant collected realtime data about temperature, load, vibration, and other important data on the

machine process. Sandvik Coromant managed this data with Microsoft Azure IoT suite, by developing a solution that connects its products with the Azure IoT Cloud. By using Mircrosoft Dynamics 365 software Sandvik Coromant provides customers with recommendations on when to change bits, order new tools or perform maintenance for improving the customer service efficiency.

Stanley Black & Decker is using Salesforce CRM to optimize their service operations by embedding the IoT devices in their machines. Following open Application Programming Interface (API) Stanely Black & Decker easily developing applications with its partners. By using embedded chips, wrenches would be able to tell to operators when they need to be calibrated. Drills could send messages when their batteries run low. Toolboxes could send notifications when tools are missing or when preventive maintenance is due. They could also send messages back to Stanely Black so the company can better understand how different types of tools are used.

Springworks SPARK is an IoT platform which uses Amazon Web Services (Cloud Services Platform) collects data from millions of cars and enables the drivers to connect with the unlimited number of service providers. This solution has helped Springworks. Spingworks successfully developed an innovative and meaningful service to its customers. Machine to Machine (M2M) communication helped the SPARK platform partner telecom company Telia to offer an unique and attractive benefits to their customers.
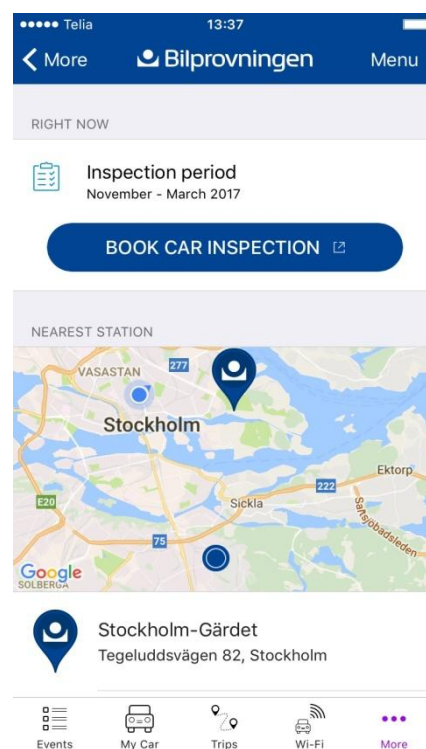

Figure 1: Mobile app notification showing the Automobile Service Notification delivered through IoT solution

Sales tracking: Coca Cola India on a pilot project Happiness on the Go (HoGo) using the mobile beverage fountain vending machines on mini trucks to cover the sales at strategic locations. Through the Osmosis IoT platform Axelta captured the real time data like GPS location, flavor and size wise sales by adding the devices to the fountain vending machines. To find the strategic information dashboards were created related to driver performance, geo location based sales data which enabled Coca Cola to monitor and control the vending trucks

and optimize and control the sales operations. Machine learning based reports helped to learn the driver behaviors. Figure 1 presents the implemented solution in diagrammatic format.
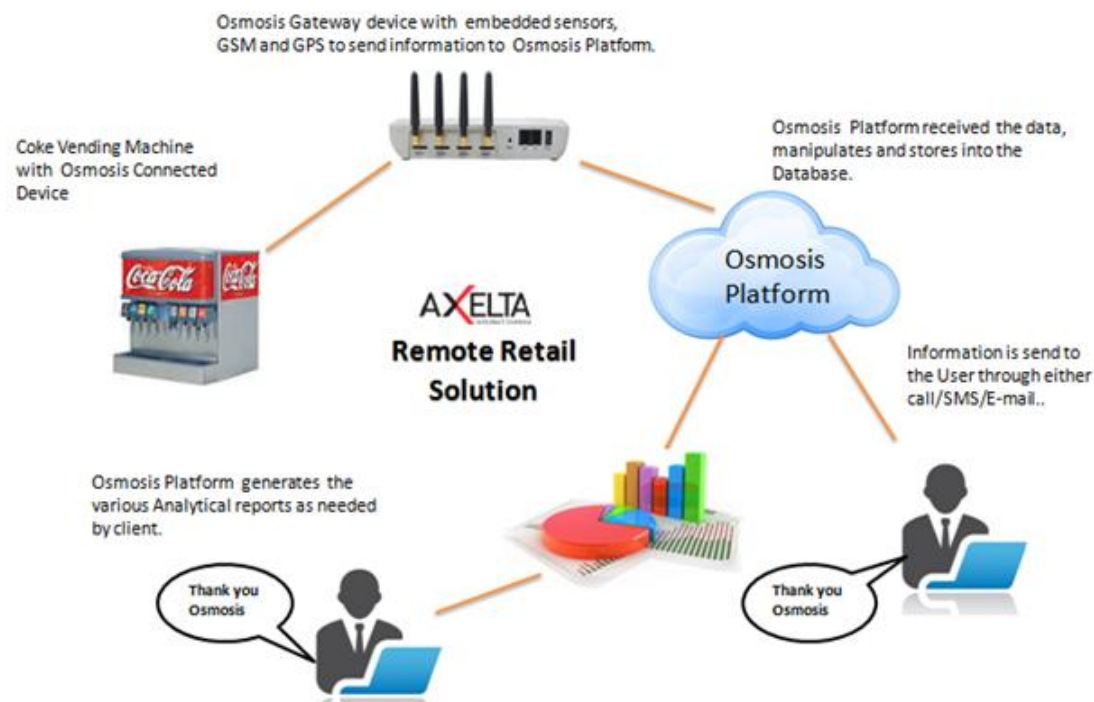

Figure 1: Diagrammatic presentation of Coca Cola Happiness on the Go Project

Analytics: Oracle Internet of Things Cloud Service platform provides predictive analytics services to enable real-time decisions on complex metrics. For extending the IoT data value, this platform integrates with other Oracle Cloud services, such as Oracle Business Intelligence Cloud Service, Oracle Mobile Cloud Service, and Oracle Integration Cloud Service.

III. CHALLENGES AND ISSUES IN IMPLEMENTING IoT

Companies can find enormous opportunities in offering innovations to the stakeholders. Following are the challenges and issues emerge while adopting the IoT technology in organizations.

- Does the IoT roadmap aligns with the organizational objectives?
- Does the organization possess IT infrastructure for smooth implementation of IoT solutions?
- Does the organization meet various industry compliance and regulations imposed by the concern regulatory bodies?
- Does the organization can protect the data generated through the IoT devices?
- Does the organization can align the existing enterprise IT applications with the IoT applications?
- Does the organization can defend IoT applications against cyber attacks?
- Does the organization provide data privacy to the stakeholders?
- Does the organization can partner with others to increase innovation?

The benefits of the IoT applications in Marketing operations are validated through the examples discussed in this article. With the huge potential benefits associated with IoT applications, organizations can run their business using IoT Business Model Framework proposed by Chan, H. C. (2015).

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