2022-05-02

# An Internet of Things (IoT) Based Approach to Innovate Canteen Stores Departments Retail Operations

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# An Internet of Things (IoT) Based Approach to Innovate Canteen Stores Department's Retail Operations

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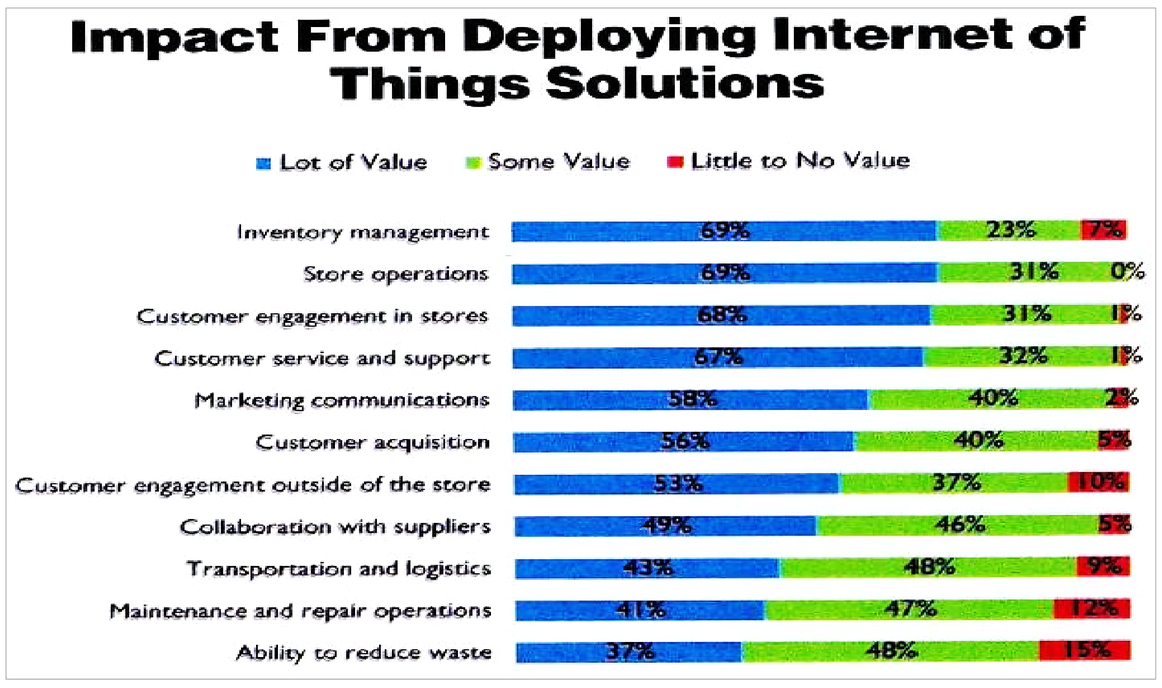
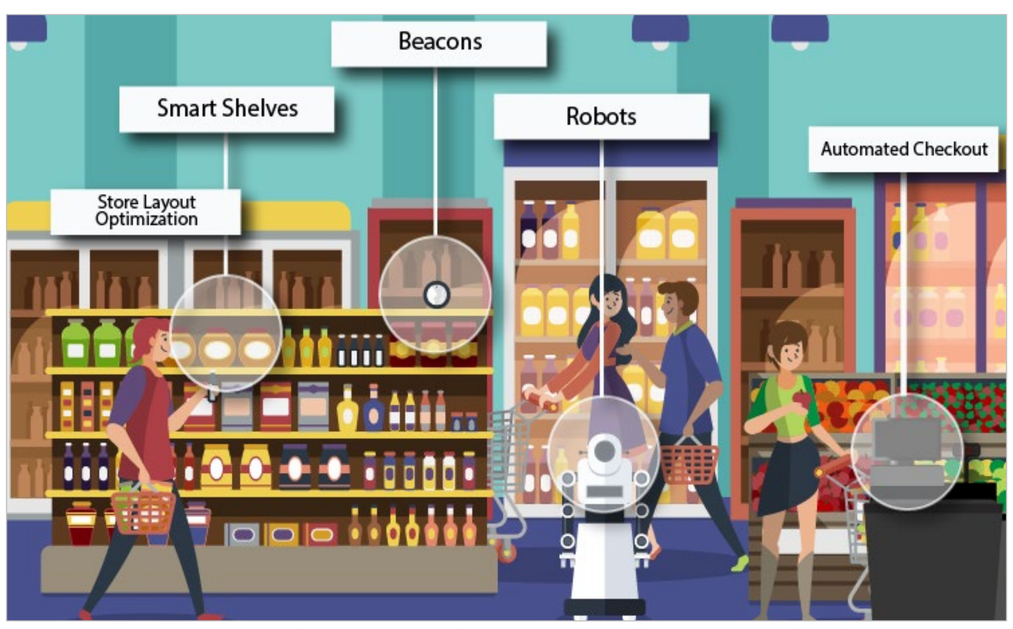
## Abstract

In the arena of globalization and competitive business environments, there is an emergent need for retail organizations to capitalize on technological tools and solutions. Retailers that adopt Internet of Things (IoT) technologies improve customer experiences and achieve cost savings. In this regard, the Pakistani-based retail chain Canteen Stores Department (CSD) can use IoT technologies to enhance its competitive advantage. This study aims to create a deeper understanding of how CSD retail operations can use IoT technologies to significantly modernize and improve CSD's business offerings.




Source: Kilcourse, B., & Rowen, S. (2016). The Internet Of Things In Retail: Getting Beyond The Hype. *Retail Systems Research.* https://www.rsrresearch.com/research/the-internet-of-things-in-retail-getting-beyond-the-hype




*Source:* 42Gears Team. (2019, May 16). How IoT is changing retail industry. *42Gears Mobility Systems*. https://www.42gears.com/blog/how-iot-is-changing-retail-industry/

## Methods

- Descriptive research with qualitative analysis of the data collected from primary and secondary sources.
- Primary information collected through personal communication with CSD's management, customers, and suppliers.
- Discussions conducted online via video/voice calls in November 2021.
- Secondary data collected from research journals, news articles, books, reports, research articles, web pages, blog posts, and conference papers.

## Results & Their Impact

- Adoption of all or a few IoT applications at the CSD store located at Rawalpindi will entirely transform CSD's operations.
- The study has suggested the IoT technologies for CSD that will:
  - Optimize store layout and in-store promotion
  - Enhance customer experience through in-store mapping on a mobile application, automated checkout system, smart customer relationship management
  - Save time and resources through digital price tagging, smart shelving, and modernized distribution, transportation, and warehousing.

| IoT Based | Ease of Shopping | Product Availability | Market-ing | Data Analyt-ics | Cost Savings | Existing Application |
|---|---|---|---|---|---|---|
| Store Layout | ✖ | | ✖ | ✖ | ✖ | Euclid, ShopperTrak, Aurora |
| Automated Checkout | ✖ | | | ✖ | ✖ | MagicBand, Verifone, Beanstore POS |
| Store Mapping | ✖ | | ✖ | ✖ | ✖ | SmartMart, Linea Pro-4 |
| Smart Shelves | ✖ | ✖ | | ✖ | ✖ | Kaa Power Shelf |
| In-Store Promotions | ✖ | ✖ | ✖ | ✖ | | iBeacon VMware |
| Digital Price Tagging | ✖ | | ✖ | | ✖ | Electronic Shelf Labels (Pricer, n.d.) |
| Smart CRM | ✖ | ✖ | ✖ | ✖ | ✖ | Combination of almost all abovementioned technologies |
| Robotics Warehouse and Distribution | ✖ | ✖ | ✖ | ✖ | ✖ | Kiva (Yudiansyah et al., 2020), ORION (Holland et al., 2017) |

Existing IoT Applications.

Adapted from: Bok, B. G. J. (2016). Innovating the retail industry: An IoT approach [Bachelor's thesis, University of Twente]. http://essay.utwente.nl/69982/

## Recommendations

- CSD may carry out a detailed technical study on each IoT application through IT experts and professionals to generate a detailed report on the technical feasibility of integration, implementation, and associated costs to develop and maintain IoT applications' infrastructure.
- This study offers management guidance to Pakistani retailers in implementing IoT technologies into their retail operations.
- Future researchers can study IoT applications in other retail domains like clothing, electronic items, furniture, and automotive.

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