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What's the “Thing” in Internet of Things in Grocery Shopping? A Customer Approach

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Abstract

The Internet of Things (IoT) technology presents an opportunity for retail groceries to develop an infrastructure that makes physical things such as mobile phone, shopping basket, store shelves, digital display, and, even the product itself smart, allowing real-time interaction with customers both in the physical store and in the virtual store. The aim of this study is to expand understanding of how IoT can create value in the retail grocery choice situation. To investigate the impact of IoT-related information on consumer choice in a shopping situation, we arranged a conjoint experiment in which participants ($n = 61$) purchased fresh salmon in a grocery store. The results (Pearson's $r = 0.939$, $p = 0.000$) show that relative to static information about price, expiry date, quality, and offers given, the real-time information was the most salient stimulus when choosing fresh salmon. Moreover, quality ratings by other customers were the most salient stimuli among real-time information, followed by an offer based on a product in the shopping cart, real-time expiry date, and real-time price. These findings contribute both to researchers and managers within grocery retailing who want to understand how IoT can be used in a way that creates value for the customers.

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1. Introduction

The term Internet of things (IoT) was coined in 1999 by Ashton [1] as a title of a presentation he made at Procter & Gamble. The idea of the IoT is that every physical thing can be connected to the Internet [2]. By connecting a sensor, actuators, and communication technology to a physical thing, they can transmit data to the Internet where it can be analyzed and used to make decisions. As such, physical things can act smarter than those without a sensor, actuators, and communication technology. The ongoing digitalization transforms the retail grocery to omni-channel retailing where [3] “the distinctions between physical and online will vanish, turning the world into a showroom without walls.” p. 23. IoT is intrinsically an important part in this transformation [4]. By connecting sensors to physical things, IoT technology can act smart by transmitting information online, offering consumers’ valuable information in their choice situation.

The IoT is, according to Gartner [5], one of the fastest growing trends in the information technology industry and is expected to have a \$14 billion economic impact by 2022. According to a report by Accenture [6] “The IoT will be particularly disruptive to the retail industry” p. 2. The IoT technology presents, therefore, an opportunity for retail groceries to develop an infrastructure that makes physical things such as mobile phone, shopping basket, store shelves, digital display, and even the product itself smart, allowing real-time interaction with customers both in the physical store and in the virtual store. Despite its promising characteristics and the expectation of a massive growth in the next decade, IoT has heretofore not been adopted within retail grocery. On the other hand, findings from a study by Acquity Group [7] of more than 2,000 U.S. consumers regarding their behavior and preferences when it comes to IoT, shows that a lack of perceived value is one of the major barriers to customers’ adoption of IoT devices such as mobile, smart watch, and tablets. An understanding of what influences consumers toward using IoT technology in retail grocery would, therefore, be of great interest to both researchers and practitioners.

There are studies regarding IoT architecture, security, and privacy [8], but only a few of them deal with IoT from a customer perspective [9]. Balaji and Roy [9] found that superior functionality, ease of use, aesthetic appeal, and presence of IoT have an impact on individuals’ perceived value of IoT. Ease of use seemed to have an especially significant effect on the perceived co-value creation of IoT. This is in line with the idea that new retail technologies should improve the customer experience and not provide a usage barrier to individuals less familiar with technology [10]. Moreover, Balaji and Roy [9] also found that superior functionality of IoT has a direct impact on individuals’ intentions to use IoT continuously. Likewise, the perceived value had an effect on continuous use and individuals’ intentions to spread the word about IoT to others (word-of-mouth intentions). According to Porter and Heppelmann [11], smart connected products are emerging everywhere; however, also according to them, it is an oversimplification to say that IoT changes everything. The same authors emphasize that the third wave of IT will not only make improvements in business performance but also improve our ability to meet many business and human needs. In other words, IoT has the potential to offer a rich set of value-creating opportunities also from a consumer or customer perspective.

Previous studies have, however, not investigated the real-time characteristics that IoT can offer customers in the choice situation. Real-time information can, for example, be expiry-date-based on sensor related data in the value chain (e.g., storage temperature, shelf life, transportation). Understanding the value characteristics of real-time information in a customer retail grocery setting would, therefore, be of great interest to both researchers and practitioners. The aim of this paper is, thus, to expand understanding of how IoT can create value for customers’ in the retail grocery choice situation. The rest of the paper is structured as follows: First, a description of the research design is given. A summary of the findings follows this. Finally, implications and suggestions for future research are offered.

2. Method

Participants were recruited in groups gathered in a seminar room at the first author’s university. The sample for the study comprises 60 participants (one case was removed due to lack of valid data). The distribution by gender was 50%

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