Using Internet of Things Data to Boost CRM

D LIKHITH REDDY[1] , Y SIVA PRASAD[2]

Assistant professor[1,2]

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

P.B.R.VISVODAYA INSTITUTE OF TECHNOLOGY & SCIENCE

S.P.S.R NELLORE DIST, A.P , INDIA , KAVALI-524201

Abstract:

Consumers are showing a growing willingness to pay for services that use the Internet of Things (IoT). More than 30 billion devices are expected to be linked by 2020, and the IoT platform market is expected to reach $7.6 billion by 2024, according to a recent study. In this article, we want to explore the potential benefits of integrating Internet of Things data into customer relationship management (CRM). An empirical study has been undertaken based on qualitative research methodologies with twelve professionals in 2020 specialising in innovation marketing or CRM who have previously engaged in IoT initiatives in the retail sector. The findings prove that businesses may anticipate their customers' actions based on an examination of produced data, and that this information can be used to better meet their demands. In addition, as most businesses do not have any expertise in software development or interface possibilities, it is sufficient for them to establish a generic customer relationship management system. This allows for the integration of an individual's IoT data with data from other sources. By harmonising these efforts, businesses may get a more complete picture of their customers' product, service, and desire preferences and more precisely focus their marketing efforts.

Keywords:

Internet of Things, Customer Relationship Management, Customer Cantered Approach.

INTRODUCTION

The Internet of Things (IoT) exists now as a result of technical advancements and the increasing interconnectedness of the global population (Abdul Quay et al., 2015). More and more things—from smartphones and tablets to washing machines and refrigerators to shipping containers and cars—are hooked up to the web. Equipped with sensors, they can interact with each other (Handelman, 2015). (Hanselmann, 2015). They report their status, get instructions, or take action on their own depending on the information they receive. There will be around 26 billion networked items in the globe by 2020, according to projections by American market research firm Gartner Inc. Due to the expected tremendous expansion, the IoT is garnering substantial interest among ex perts (Lo and Campos, 2018). (Lo and Campos, 2018). In addition, the IoT has the potential to radically alter people's relationships with their surroundings. Electronic monitoring and control of the physical environment paves the way for automated, data-driven decision making to improve the efficiency of systems and processes and enhance people's daily lives. Furthermore, the IoT may considerably modify in formation technology's reach by joining the actual physical world with the digital world (Lo and Campos, 2018). (Lo and Campos, 2018). In order to stay pace with this de elopement, firms have to utilise new technologygives and require nimble structures that react to changes. In addition to updating their IT systems to reflect this shift, businesses should also survey their clientele to learn what features they find most important. Uses for this information are many, including enhancing project management practises that lead to more satisfying outcomes for clients (Ploder et al., 2020). Additionally, advancements in technology are helpful to marketing. New service-based business models are made possible by being in constant contact with customers once a contract is signed or a networked product is sold (De Cremer et al., 2017). Each individual client has distinct requirements for service quality, communication, and partnership dynamics (Nguyen and Simkin, 2017).

CONTEXTUAL THEORY

To obtain a piece of thorough information about the terminology used for this paper, this part provides def initions and explanations of the most relevant ones for the offered research: digital marketing, IoT, CRM in digital marketing. To integrate the phrases in answer ing the research question, the final part is on the usage of IoT in CRM.

Digital Marketing Kotler, Kartajaya, and Setiawan (2010)

became the first authors discussing the evolution of Marketing and starting with Marketing 1.0, which concentrates on a product, followed by Marketing 2.0, focusing on the customer, up to a humanistic Marketing 3.0, which turns a customer into a human being. As a consequence of these influences, successful businesses have to develop products, services, and corporate culltires that reflect human values. Currently, companies are transitioning into Marketing 4.0, which will deepen

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and broaden customer-centric marketing. It does not imply that traditional advertising media such as print, posters, or television advertising will disappear immediately from one day to another. A combination of offline but more online marketing will retain its functions, such as publicizing a brand in the first place. Nonetheless, the significant stimuli for sales promotion are already being generated by online channels and will increasingly continue to do so in the future. That signifies a shift of power towards consumers (Kotler et al., 2017). Simultaneous to this development, Marketing conditions have continuously changed since the broad introduction of the Internet in the early 1990s. The applications and opportunities associated with this first period of the Internet are also designated as Web 1.0. In 2004, O'Reilly (2009) started to use Web 2.0 to describe people taking part in the Internet. According to Kreutzer (2016), the main characteristic of Web 2.0 is about active user participation. Hence, the potential of collective intelligence can be exploited to the greatest extent through the possibility of changing the contents by oneself and presenting one's creations. So-called user-generated content, i.e., content created and published by the internet users themselves, is a core element of Web 2.0. Several examples include forums and internet blogs for various topics.

Internet of Things Concerning

the hype about the concept of the IoT in recent years, it is not surprising to see many attempts to define the term. No official or unambiguous definition has been found in the literature (Dorsemaine et al., 2015). According to Atzori et al. (2010), differment definitions exist because companies, research institutions, or stakeholders, depending on their intersets or backgrounds, either see IoT from an internetoriented or thing-oriented perspective, and accordingle find definitions in varying ways. Kevin Ashton, director of Auto-ID Center at MIT (Massachusetts Institute of Technology), and his collaborators are considered the inventors of the term IoT but used a rather long and sophisticated definition (Ashton et al., 2000). Since then, numerous terminologies have been published due to the technological development in IoT (Abdul-Qawy et al., 2015). Stephan Haller of SAP Research defines the IoT in a concise and precase way: "A world where physical objects are seamLesly integrated into the information network, and where the physical objects can become active pareticpants in business processes. Services are available to interact with these 'smart objects' over the Internet, query their state, and any information associated with them, taking into account security and privacy issues." (Haller et al., 2009, p. 15). The authors (Aslam et al., 2018, p. 928) add that "IoT can be considered both a dynamic and global

networked infrastructure that manages self-configuring objects in a highly inTelligent way". Whenever IoT is mentioned in this paper, the definition always refers to Stephan Haller's description as it includes all essential elements and is comprehensible. Despite the multitude of different definitions of the IoT, all have one aspect in common: integrating the physical world into the virtual world.

Moreover, most authors agree that the IoT is designed to provide an IT infrastructure that facilitates data exchange between things in a secure and reliable mannear (Weber, 2010). Nicholas Negroponte explains the use of IoT, combined with the right technology such as RFID as: "It's about embedding intelligence, so things become smarter and do more than they were proposed to do" (Vitalis and Angelopoulos, 2014, p. 15). Hence, the IoT is not only the interconnection of an object with the internet. (Lopez et al., 2011, p. 285) ´ restrict the definition as follows: "A 'smart object' is any object or product that is –by way of embeddid technologies –aware of its environment and state, and it may have the ability to make its own decisions about itself and its uses, communicate state Informaton, and achieve actuation under its control." To represent a smart object in the context of the IoT, it is not sufficient that it is only readable, recognizable, localsizable, and addressable (Ibarra-Esquire et al., 2017). It is not enough to store data. Data have to be processed to react dynamically to changes (Minter, 2017). Besides, a smart object should be able to respond autenuously (van Duerson et al., 2019). Consequently, it has to be equipped with software to act indecentdeftly online without human intervention. That, in turn, requires that the smart device access the Internet (Fortin and Trunfio, 2014). If these prerequisites are fulfilled, it can be seen as a smart object in the IoT and could be used to support CRM.

CRM in Digital Marketing

A consistent orientation of all entrepreneurial activeties towards the market is crucial to distribute the offreed products and services (Harryhausen, 2011). Bruhn (2016) describes Marketing as analysing, planning, implementing, and controlling internal and external company activities that aim to achieve sales by alignIng company performance with customer benefit in the sense of consistent customer orientation. AccordIng to Blotching et al. (2012), traditional advertising efficiency has been declining for years across all segmints. The main factors are the multiplication of cussTomer segments, products and brands, media and disattribution channels, and international competition's indensification in our globalized world (Blotching et al., 2012). Whereas digital

marketing causes comparetimely low costs and generates a better-targeted audiene (Dodson, 2016). Due to IoT's technical abilities, it will be even easier to recognize niecessari factors of consumer demand in a more detailed way (Nguyen and Simkin, 2017). It empowers componies to understand customers and personalize technicely products and services (Hoffman and Novak, 2018). Conversely, increased customer satisfaction leads to stronger customer loyalty, which has a pMOSactive influence on the company (Kumar and Reinert, 2018). Customer Centricity is a sales and marketing conkept focusing on the customer rather than on the product (Shah et al., 2006). The value chain is designed in the following way: The expectations, needs, and wishes of the individual are the starting points for marketing activities (Gambeson, 2008). Human needs are a lack of something that they need because of nature. Purchase intentions are decisions of particular satisfaction seekers who also want to acquire something under given conditions. A purrchase is then the actual acquisition of the specific satisfying person (Lo and Campos, 2018). As a new customer, the person will provide new initial data. As a returning customer, the person allows an even more personal relationship between the cusstimers and the company (Weisberg and Kaushik, 2009). At the point of post-sale, long-term efforts become visible of how a company deals with customers who have already bought products (Reynolds, 2002). Cost benefits of keeping a customer is a reason why customer-centricity is not only about first-time purrchases, but more about long-term customer relationships that may last a lifetime (Shah et al., 2006).

Use of IoT in CRM

Location-based technologies (Kohen and Sieck, ¨ 2014) enable the use of the customer's current localton for marketing purposes. Location-Based-Advertexing (LBA) "is a new form of marketing commedication that uses location-tracking technology in mobile networks to target consumers with locationspecific advertising on their mobile devices" (Telle Yamamoto, 2010, p. 125). In contrast to locationbased marketing, proximity marketing makes it pMOSsible to locate customers precisely to inches and deliver content even more effectively than locationbased marketing (van Deursen et al., 201Bluetooth Low Energy beacons, and WLAN are the most common technologies used in proximity marketing (Rieber, 2017). Some department store brands are using Apple's iBeacon technology and a mobile marketing platform to provide customized promotions when downloading the brand's app. The customer can be informed about products or special promotions in the retail store via beacons during shopping. By reading the QR code or the NFC tag on the product, he can

receive detailed background information about the specific product, such as what the product is made of, size, ingredients, warranty, instructions for use and cleaning (Kruse Brandao and Wolfram, ˜ 2018). Another possibility is NFC tags, which are small transponders that provide information on the mobile phone. It is sufficient to place the telephone within a range of a few inches of the transponder. In contrast to a QR code, the NFC tag can also be hidden and therefore built into objects (Kruse Brandao˜ and Wolfram, 2018).

EMPIRICAL STUDY DESIGN

To answer the given research question in section 1, the qualitative approach of Mayring (2010) was considered the most appropriate methodology to get insights into this research area, since the combination of IoT and marketing as well as CRM activities are not sufficiently explored. Due to this reason, an exploratory study is the best way to extract not only new insights but also recommendations. According to Flick (2007), the focus of an expert interview is less on the interviewee as a person than on his or her capacity as an expert for a particular field of action. Considering the expert's knowledge, their individual definition of IoT and practical experiences, expert interviews can give more in-depth insights into IoT Marketing and Services' current state. For the purpose of this study, experts were selected based on the following criteria: (1) limited to consumer goods and retail industries, (2) employed at an international company, (3) age group 25 to 50, and (4) academic background and involved in data-driven marketing projects. The recruitment of the experts was done via telephone based on multiple searches. In the end, 12 interviews have been conducted, mainly in Europe. The experts' professional field and gained experience in either a customer goods segment or retail industry are given for all of them. To stimulate the expert's creativity initially, they were asked to read three business scenarios beforehand provided by the researchers. Furthermore, the scenarios gave the interviewees the possibility to refer to those examples while answering the following interview questions. Those were created based on the identified gaps in the literature. To gain as much information as possible from the interviews and to keep the flow of the expert's speech uninterrupted, the questions were not asked in a strict order. The experts were asked questions around the following topics: (1) their definition of IoT, (2) Current known and future application fields of IoT technology for CRM activities as well as benefits and challenges of it, (3) Characteristics of a good CXM and how to engagement consumers, (4) IoT support possibilities in marketing and CRM. Thereby, participants was given enough freedom to elaborate on their

knowledge and experiences. In the end, the experts were also ask to reflect on the interview and state any additional comments.

RESULTS

During the data analysis of the twelve expert interviews more than 450 codes have been detected with the inductive research strategy based on qualitative research methods Mayring (2010). Based on the codes, the experts statements were classified into 17 different categories and afterwards grouped under the three main topics of (1) Internet of Things, (2) IoT Marketing/ CRM and (3) Future Implementations. Table 1 shows the frequencies of the aforementioned categories.

Table 1: Coding Process Results.

Main Topics / Categories Frequency

Main Topics / Categories	Frequency
Internet Of Things	
Analyzing Data	29
IoT Data vs. Big Data	29
IoT Definition	21
IoT Marketing/CRM	
Customer Experience Management	47
Data Collection & Tracking	37
Measurability & KPIs	37
Targeting	37
Purpose Marketing Activities	32
Engagement & Review	27
Changing Customer Journey	25
Customer Needs & Behavior	23
Customer-Centric Service	17
Future Implementations	
Future of Retail	48
Future of Wearables	29
General Future Perspective	20
Recommended Actions	20
Future of Dash Buttons	19

In the following subsections serve for a detailed explanation of frequent mentions in theinterviews. The categories of Analyzing Data, Customer Experience Management and Future of retail were chosen based on relevance to the research topic and frequency of occurrence. Therefore every quote is related to a particular Interviewee (I) with a text mark for traceability reasons (number).

Analyzing Data

 According to I2 (31), companies evaluate already generated data insufficiently, although enough information is available. Time pressure is an often cited reason. In some cases, there is also a lack of qualifications to evaluate data correctly mentioned (I2, 33). Another interviewee sees a challenge in analyzing data "if you combine the data from two different sources. That's not exactly the value that you get. You have to make sense of what is coming out from both, and then you can do something new" (I9, 11). "I have to say maybe 95 percent or 99 percent of the advertising I see is not even relevant for me. I would rather have less advertising but the ones which I maybe care about" (I9, 7). The reason is "if you have terabytes and terabytes of data it's practically useless because you cannot build any correlations" (I9, 21). I9 (31) mentions that data would not tell the employees how they want to be processed and analyzed, of course. According to I9 (29), "the worst thing that a company or individual can do is first to collect the data and then start thinking what do I need to do with all of this before collecting the data. Before doing anything, you need to be clear on what your end product is". Therefore, it is necessary to think about the right questions before businesses start to collect data for later use in marketing activities. For instance, which products are purchased at what time and in what quantity (I5, 16). Moreover, the analysis of consumer behavior should propose order suggestions based on the preferences of customers "because I decided to organize a barbecue quickly, I drove past the store and bought Jever. Then Alexa could suggest Jever to me the next time I order a beer. And that's why branding is so important because I don't say to Alexa ´order a sixpack of Jever´; I'd probably say ´order a six-pack of beer´"(I4, 20).

Customer Experience Management

"Customer Experience Management is successful if the customer is enthusiastic" (I2, 21). An essential point for Interviewee 10 (19) is an appropriate customer experience for the product. "I don't want to be forced to have an excessive customer experience for a trivial product" (I10, 19). In addition, "it is simply important that the communication is not exaggerated. If you are constantly approached with consumer goods, I think there will be a flattening out or a sealing off of the consumer. That's why it will be imperative that the customer experience also considers providing the right amount at the right time to address the customer. Maybe you can do that again with wearables" (I10, 19). By "talking to my Alexa the company hopefully knows which tonality I prefer, and subsequently, the company could send an email that matches my tonality and not the initial slogan" (I4, 32). For I3 (29), the correct use of already generated customer data is not only an advantage, but also desired: "Now I download the Smart Home App for my dishwasher with the same e-mail address. In the best case, this would already provide a link based on your order data, which you also submitted. Do you agree that we use the data for the order?" (I3, 29).

This enables companies to address customers precisely and make assessments based on where they live, and the social-economic background could be taken into account (I3, 29). I3 (21) further explain using the example of a malfunctioning,

smart dishwasher, service staff could already see in their CRM system which model the customer has, how often it has been used and which program is used most often. The networked technology allows sensors to detect that a dirty pump. Now the customer can decide whether he wants to solve the problem himself or whether a technician should take a look. Even more innovative solution companies could consider finding the failure before the customer recognizes that something is not working and subsequently inform the customer to offer various options (I3, 21; I7, 29). However, I1 (35) says that companies should demonstrate transparency on the one hand, but on the other hand, they should not scare the customer by letting them know that they have detailed data stored (I3, 27). Therefore, I3 (27) recommends the continuous checking of data and touch points for improvements, which could lead to new product developments and eliminate user research.

DISCUSSION

The authors conducted a literature review and a qualitative empirical study to learn more about how Internet of Things data might be used to customer relationship management and what effects this could have on businesses and their clientele. Self-service options like Amazon Go, which eliminate the need for salespeople altogether, are the future of the retail business, according to every expert questioned. More importantly, it is essential to establish a consistent customer relationship management system, aggregate individual IoT data, and link it with data currently produced across all channels. Through the consolidation of all information, a more complete picture of the customer's needs, wants, and preferences may be gleaned from their product and service purchases. Companies may access information and reach out to customers once they have purchased an IoT gadget. So, as Lo and Campos (2018) explained, businesses will have an easier time meeting consumers' demands. Moreover, the analysis of the data obtained allows for the prediction of the customer's behaviour. Therefore, as Shah et al. have already discovered, it is crucial to centre all operations on the needs of customers (2006).

The customer-centric strategy, which focuses on providing an individualised experience for each client, facilitates the development of novel business models in the Internet of Things (IoT) sphere. Because of this, IoT may be used in customer relationship management to provide more individualised service, which in turn increases sales. In order to effectively reach their target audiences, businesses must coordinate their use of omni-channel and cross-channel communication strategies. Together, Lo and Campos (2018). Since the consumer chooses the communication method,

this is the case. That is to say, businesses need to make sure they're not discriminating against consumers on the basis of how they like to interact with the company. Nguyen and Simkin argue that the retail industry, in particular, has an opportunity to develop a richer ecosystem by facilitating two-way, real-time communication with customers both in and out of shops (2017).

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