# Making Better CRM Decisions with IoT Data

Mr. V. SRINIVAS[1], Mrs. GUDAPATI BLESSY
CHRISTINA[2], Mr. J.E.N. ABHILASH[3]
ASSOC PROFESSOR[1,2] , ASSISTANT PROFESSOR[3] DEPARTMENT OF ECE, SWARNANDHRA COLLEGE OF
ENGINEERING AND TECHNOLOGY, NARASAPUR

## Abstract:

More and more, customers are prepared to pay for services that use the IoT. According to a recent report, there will be over 30 billion connected devices by 2020, and the market for IoT platforms is projected to reach $7.6 billion by 2024. In this piece, we'd like to delve into the possible gains from combining CRM with data from the Internet of Things. A qualitative research study was conducted in 2020 with twelve retail industry executives with expertise in innovation marketing or customer relationship management who had experience with Internet of Things (IoT) projects. Based on an analysis of created data, companies may predict their consumers' activities, which helps them satisfy their requests better. Furthermore, a generic customer relationship management system is enough for most firms as they lack knowledge in software development and interface capabilities. As a result, data from an individual's IoT devices may be combined with data from other sources. Businesses may get a better understanding of their consumers' product, service, and demand preferences by coordinating these activities, which will allow them to target their marketing efforts more accurately.

## Keywords:

Relationship management with customers, the internet of things, and an approach focused on those customers.

## INTRODUCTION

Thanks to developments in technology and the growing number of people who are online at all times, the IoT has come into existence (Abdul Quay et al., 2015). The number of internet-enabled devices is growing rapidly. This includes anything from vehicles and shipping containers to washing machines and refrigerators. Their ability to communicate with one another is enhanced by the presence of sensors (Handelman, 2015). Specifically, according to Haarsmann (2015). They report their progress, receive orders, or act independently based on the information they gather. American market research company Gartner Inc. predicts that by 2020, there will be around 26 billion networked objects in the world. According to Lo and Campos (2018), the Internet of Things is attracting a lot of attention from experts because of

its predicted massive growth. This is according to Lo and Campos (2018). Furthermore, the Internet of Things (IoT) may cause a sea change in how humans interact with their environments. Automated, data-driven decision-making is made possible by electronic monitoring and management of the physical environment, which improves the efficiency of systems and processes and enhances people's everyday life. The Internet of Things (IoT) also has the potential to expand the reach of information technology by bridging the gap between the digital and physical realms (Lo and Campos, 2018). This is according to Lo and Campos (2018). To keep up with this de elopement, companies need to take use of new technological advancements and have adaptable structures. Companies should poll their customers to find out which features are most essential to them and update their IT systems accordingly. This data has several potential applications, one of which is improving project management techniques to provide customers with better desirable results (Ploder et al., 2020). Innovations in technology also benefit the marketing industry. Following the signing of a contract or the sale of a networked product, ongoing communication with the client enables new service-based business models (De Cremer et al., 2017). When it comes to relationship dynamics, communication, and service quality, every customer is unique (Nguyen and Simkin, 2017).

## The Theory of Context

Here you can find definitions and explanations of the most important terms used in this paper: digital marketing, IoT, CRM in digital marketing. This will give you a good idea of the scope of the study. Finally, the section on the use of IoT in CRM is included to help answer the research question by integrating the words.

## Marketing in the Digital Age by Kotler, Kartajaya, and Setiawan (2010)

were the pioneers in tracing the development of marketing from its product-centric Marketing 1.0 to its customer-centric Marketing 2.0 and finally to its humanistic Marketing 3.0, which elevates the consumer to the status of a person. Businesses that want to thrive in today's market must respond to

these forces by creating goods and services that align with human values and principles. Marketing 4.0, which aims to expand and deepen customer-centric marketing, is now being implemented by corporations. Traditional forms of advertising including print, posters, and television commercials will not just vanish overnight. The original purposes of both online and offline marketing, such as brand promotion, will continue to exist. However, internet platforms are already and will continue to be the primary generators of sales promotion stimulus. According to Kotler et al. (2017), this indicates that customers are becoming more powerful. Concurrent with this transition, marketing circumstances have been in a constant state of flux since the widespread launch of the Internet in the early 1990s. "Web 1.0" is also the name given to the possibilities and applications that were part of the early Internet. O'Reilly (2009) first used the term "Web 2.0" to characterize Internet users in 2004. Active user interaction is the key feature of Web 2.0, according to Kreutzer (2016). The ability to make one's own changes and share one's own inventions allows the potential of collective intelligence to be fully used. A fundamental component of Web 2.0 is what is often known as user-generated content, or material that is made and shared by anyone using the internet. Forums and online blogs covering a wide range of subjects are only two examples.

## Relevant to the Internet of Things

There have been several efforts to define the phrase "Internet of Things" (IoT) due to the current excitement around the notion. Dorsemaine et al. (2015) noted that there is a lack of a clear and authoritative definition in the literature. The reason why many definitions exist is because different corporations, research institutes, or stakeholders see the Internet of Things (IoT) from different angles. Depending on their interests or backgrounds, they may view it from an internet-oriented or thing-oriented viewpoint, and as a result, they come up with different definitions. The Internet of Things (IoT) was first proposed by Kevin Ashton, head of the Auto-ID Center at MIT (Massachusetts Institute of Technology), and others in 2000; however, their description was lengthy and technical (Ashton et al., 2000). As a result of advancements in IoT technology, a plethora of new terminologies have been developed since then (Abdul-Qawy et al., 2015). In a nutshell, the Internet of Things is "a world where physical objects are seamLesly integrated into the information network and where the physical objects can become active pareticpants in business processes," according to SAP Research's Stephan Haller. Taking privacy and security concerns into

consideration, there exist services that allow users to communicate with these "smart objects" online, find out what they're doing, and access any data linked to them. (Hart et al., 2009, page 15). Additionally, "IoT can be considered both a dynamic and global networked infrastructure that manages self-configuring objects in a highly inTelligent way" (Aslam et al., 2018, p. 928). Every time the Internet of Things (IoT) is brought up in this article, the definition is based on Stephan Haller's explanation since it covers all the bases and is easy to understand. There may be a lot of various ways to define the Internet of Things (IoT), but they all boil down to the same thing: connecting the real and virtual worlds.

In addition, the majority of writers believe that the Internet of Things is created to provide a framework for information technology that enables the safe and dependable transfer of data between objects (Weber, 2010). The Internet of objects (IoT) may be used in conjunction with appropriate technologies, such radio frequency identification (RFID), according to Nicholas Negroponte: "It's about embedding intelligence, so things become smarter and do more than they were proposed to do" (Vitalis and Angelopoulos, 2014, p. 15). Therefore, the Internet of Things encompasses more than just the linking of physical objects to the web. Reference: (Lopez et al., 2011, p. 285) We can narrow the definition to the following: "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 information, and achieve actuation under its control." A Reading, recognising, localizing, and addressability are not enough to represent a smart item in the context of the Internet of Things (IoT) (Ibarra-Esquire et al., 2017). Keeping data is insufficient. In order to respond quickly to changes, data must be processed (Minter, 2017). After all, autonomous response is an essential feature of any intelligent device (van Duerson et al., 2019). Therefore, it needs software that can behave impishly online without any help from a human. The next step is for the smart gadget to be able to connect to the Internet (Fortin and Trunfio, 2014). Assuming these conditions hold, it has the potential to be a CRM-supporting "smart object" in the Internet of Things.

## CRM for Online Ads

In order to spread the free goods and services, entrepreneurs must maintain a constant focus on the market (Harryhausen, 2011). According to Bruhn (2016), marketing is the process of studying, planning, executing, and regulating the internal and external operations of a business with the goal of increasing sales via consistently orienting business

performance toward the benefit of customers. The effectiveness of conventional advertising has been on the decline for quite some time, according to Blotching et al. (2012). In today's increasingly globalized market, the primary drivers are the proliferation of customer groups, brands, goods, and media as well as the indensification of worldwide rivalry (Blotching et al., 2012). Online advertising, on the other hand, has much lower overhead and produces more relevant results (Dodson, 2016). The Internet of Things' technological capabilities will make it much simpler to identify crucial elements of customer demand with greater precision (Nguyen and Simkin, 2017). As a result, businesses are better able to comprehend their clients' needs and provide technologically tailored goods and services (Hoffman and Novak, 2018). The inverse is also true: when customers are happy, they are more loyal, and that's good for business (Kumar and Reinert, 2018). Customer centricity refers to a marketing and sales philosophy that prioritizes the consumer above the product (Shah et al., 2006). Here is the layout of the value chain: According to Gambeson (2008), marketing campaigns begin with the consumer's wants, needs, and expectations. One example of a human need is the absence of a naturally occurring resource. A purchase is the actual acquisition of the individual satisfied person; a purchase intention is the choice of a satisfaction seeker who also wants to buy anything under set circumstances (Lo and Campos, 2018). They will provide fresh starting information as they are a new client. The customer's continued patronage fosters an even closer bond between the business and its clientele (Weisberg and Kaushik, 2009). The post-sale phase is when a company's attempts to maintain relationships with its clients after the sale become apparent (Reynolds, 2002). According to Shah et al. (2006), customer-centricity is all about building long-term connections with customers, not only for one-time purchases, because of the cost advantages of retaining them as customers.

## Applying IoT to Customer Relationship Management

Using the customer's present location for marketing objectives is made possible by location-based technology (Kohen and Sieck, 2014). To target customers with location-specific advertising on their mobile devices, location-based advertising (LBA) "uses location-tracking technology in mobile networks" (Telle Yamamoto, 2010, p. 125). Presence marketing, in contrast to location-based marketing, allows for more accurate client location down to the inch and more efficient content delivery than location-based marketing (van Deursen et al., 201According to Rieber (2017), the majority of proximity marketing systems use

WLAN and Bluetooth Low Energy beacons. Utilizing a mobile marketing platform and Apple's iBeacon technology, a number of department store companies are offering personalized incentives to app downloaders. As the shopper browses, beacons may notify them of new arrivals, sales, and other store-wide events. According to Kruse Brandao and Wolfram (2018), a user may get comprehensive product details including material composition, dimensions, ingredients, warranty information, use directions, and cleaning instructions by scanning the product's QR code or NFC tag. Near Field Communication (NFC) tags, which are tiny transponders that provide data to the phone, offer an additional option. Simply positioning the phone within an inch or two of the transponder will do the trick. An NFC tag, unlike a QR code, may be concealed and integrated into physical things (Kruse Brandao˜ and Wolfram, 2018).

## Research Methodology

stated the lack of adequate exploration of the intersection of IoT and marketing as well as CRM activities, the qualitative technique of Mayring (2010) was deemed the most suitable methodology to get insights into this study field and answer the research question stated in section 1. For this reason, if you want to get fresh thoughts and suggestions, an exploratory research is your best bet. Flick (2007) argues that in an expert interview, the interviewer is more interested in the interviewee's competence in a certain area than in the interviewee's personality. Expert interviews may provide more in-depth insights into the present status of IoT Marketing and Services by considering the expert's expertise, their particular definition of IoT, and practical experiences. This study's specialists were chosen according to the following criteria: (1) they had to be engaged in data-driven marketing initiatives and work for a multinational firm; (2) they had to be between the ages of 25 and 50; and (4) they had to be confined to the consumer goods and retail sectors. After doing repeated searches, the specialists were recruited over the phone. Ultimately, 12 interviews were carried out, with the majority taking place in Europe. Each expert's biography includes their academic background and work history in the retail or consumer products industries. The researchers gave the experts three business situations to study in advance in an effort to spark their imaginations. Plus, the interviewers may use the situations as a guide for answering the questions that followed. Those were made in response to the gaps that were found in the literature. The questions were not asked in a tight sequence to ensure maximum information acquisition from the interviews and to maintain the expert's continuous speaking. First, we wanted to know how the experts defined the Internet of Things (IoT). Second, we wanted to

know what CRM activities currently and in the future use IoT technology, and third, we wanted to know what makes a good customer experience management system (CXM) and how to engage consumers. Lastly, we wanted to know what opportunities there were for IoT support in marketing and CRM. This allowed the participants sufficient leeway to share their insights and experiences. Finally, we asked the experts to think over the conversation and provide any thoughts or observations they may have.

## RESULTS

More than four hundred and fifty codes were found using the inductive research approach grounded on qualitative research methodologies by Mayring (2010) during the data analysis of the twelve expert interviews. We first sorted the expert comments into 17 groups according to the codes, and then we categorized them into three broad topics: (1) the Internet of Things; (2) IoT marketing/CRM; and (3) future implementations. You can see how often each of the groups appears in Table 1.

**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 |

The following parts provide an in-depth analysis of topics brought up several times during the interviews. Data analysis, customer experience management, and the future of retail were selected because of their prevalence and relevance to the study's subject. A text mark is used to associate each quotation with a specific interviewee (I) for the purpose of traceability (number).

## Analyzing Data

Even though there is abundant information accessible, firms do not adequately assess previously created data (I2 (31)). People often mention time constraints as a cause. There is also a dearth of expertise in evaluating the cited facts in some instances (I2, 33). When asked about the difficulty of combining data from two sources, another respondent raised the same point. To be more precise, it is not the value you get. Before you can accomplish anything new, you have to make sense of what is coming out of both (I9, 11). Probably as much as 95% or 98% of the ads I view have nothing to do with what I'm looking for. I like less ads overall, unless they're for something I may be interested in (I9, 7). "If you have terabytes and terabytes of data it's practically useless because you cannot build any correlations" (I9, 21) is the key reason for this. It goes without saying that workers would not be able to specify their preferred method of data processing and analysis in I9 (31). "The worst thing that a company or individual can do is first collect the data and then start thinking what do I need to do with all of this before collecting the data," said in I9 (29). Make sure you know exactly what you want out of the final result before you do anything. So, before companies begin collecting data for marketing purposes, they need to consider the correct questions to ask. For example, when and how much of which items are bought (I5, 16). Because I wanted to throw a last-minute BBQ, I stopped by the shop and picked up some Jever, so it's clear that consumer behavior analysis has to take customer preferences into account when making purchase recommendations. The next time I place an order for a beer, Alexa may recommend Jever. Branding is crucial since people aren't likely to ask Alexa to "order a six-pack of Jever" but rather "order a six-pack of beer" (I4, 20).

## Management of the Customer Experience

The key to a great customer experience is an excited client (I2, 21). Appropriate product user experience is a key concern for Interviewee 10 (19). "I refuse to deal with an overly demanding customer service representative over a meaningless product" (I10, 19). The message must also not be inflated, since this is of utmost importance. There will be a consumer flattening or shutting off if you are continuously approached with consumer products, in my opinion. For this reason, it is crucial to think about giving the correct quantity to the right client at the right moment as part of the customer experience. The use of wearable technology could allow you to repeat it (I10, 19). A corporation may "hopefully know which tonality I prefer by talking to my Alexa, and subsequently, the company could send an email that matches my tonality rather than the initial slogan" (I4, 32). Properly using consumer data that has previously been collected is not only advantageous, but also desirable, according to I3 (29): Now I use the same email address to download the Smart Home app for

my dishwasher. Ideally, this would automatically generate a link using the information from your purchase that you had provided. Is it okay with you if we use the information for the order? It is stated in (I3, 29).

Businesses may now target their messages more directly and evaluate consumers according to their location and, perhaps, socioeconomic status (I3, 29). Using a smart dishwasher that isn't working as intended, I3 (21) goes on to say that the support team might already know the customer's model, use frequency, and most popular application in their CRM system. Sensors can identify a filthy pump thanks to networked technology. The next step is for the client to choose between fixing the issue on his own or calling a specialist. Innovative solution providers might go a step further by identifying the problem before the client even realizes anything is wrong, then informing them of their alternatives (I3, 21; I7, 29). On the one hand, firms should be transparent (I1 35), but on the other, they shouldn't frighten customers (I3, 27) by disclosing the amount of data they keep. As a result, I3 (27) suggests that data and touchpoints should be continuously checked for improvements. This might result in new product innovations and the elimination of user research.

## DISCUSSION

In order to get a better understanding of the potential benefits and drawbacks of incorporating Internet of Things data into customer relationship management strategies, the authors undertook a qualitative empirical research in addition to a literature review. No matter how many experts you consult, they all agree that self-service solutions, such as Amazon Go, will soon replace salespeople entirely. Even more crucial is the need to integrate all existing channels' data with individual IoT data, aggregate it, and set up a uniform customer relationship management system. By bringing all the data together, we can better understand the customer's goals, requirements, and preferences as they relate to the products and services they buy. Upon purchasing an IoT device, businesses have access to data and may communicate with consumers. Therefore, companies will find it simpler to satisfy customer requests, as Lo and Campos (2018) noted. In addition, the collected data may be used to forecast the customer's actions. Accordingly, it is essential to focus on customer demands in all activities, as Shah et al. have previously found (2006).

Innovative business models in the IoT space may be more easily created with a customer-centric approach that prioritises tailoring services to the specific needs of each client. As a result, the Internet of Things (IoT) has the potential to enhance sales via the implementation of customer relationship management systems that provide for more personalized service. Coordination of omni- and cross-channel communication tactics is essential for firms to successfully reach their target audiences. Lo and Campos (2018) collaborated. The reason for this is because the customer gets to decide how to communicate. In other words, companies should not treat customers differently only because of the way they like to collaborate with them. The retail sector, according to Nguyen and Simkin (2017), can build a more robust ecosystem by enabling two-way, real-time connection with consumers in-store and online.

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