

# Role Of Iot In Transformation Of Marketing: A Quantitative Study Of Oppurtunities And Challenges

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## ABSTRACT

IoT refers to Internet of Things, the official definition of IoT defines it as a system connecting computing devices which has the capability of transferring data over a network without any human interaction. All the devices we use in our daily lives have some use of IoT. This helps marketers or marketing companies to efficiently interact with their user base. In today's world, data has become extremely precious to the companies and with the introduction of AI in the marketing ecosystem, data can now be processed without any hassle whatsoever. AI supplements digital IoT applications by enabling it to be more relative, perspective and analytically sufficient. Experts predicts that number of internet connections will triple by 2050, which implies usage of IoT will only increase in the upcoming decades. This makes it more than necessary to study and research the challenges that IoT brings in our lives and in marketing. A sample of 393 respondents was surveyed to find different roles of IoT and their significance in marketing transformation. Multiple regression was applied to

reach to end results. The study concludes that there is a significant impact of IoT in marketing transformation.

**KEYWORDS:** Digital Marketing, Huge Databases, Security And Safety, Customer Expectations, Purchase Patterns.

## **INTRODUCTION**

The term IoT refers to the Internet of Things, which was given in the year 1999 by “Kevin Ashton” while he was trying to draw attention towards the usefulness of radio waves on the in gambits to keep a check on malpractices. Internet of Things has come a long way since then, it is defined as the devices small or big connected to each other with the help of a private or public network. Internet is one of the most crucial players in the development of the internet of things. The internet in itself a gone through a transformation with increasing functionality, widening range of connectivity, and complete integration in different sectors of the world. It is now an essential part of one's life and in many parts of the world is even considered a basic right (Ali, et al., 2021).

The development of internet was essential to the progress of the Internet of Things (IoT) making it mainstream. Today, it has radically changed the lives of people as well as the corporate world. With the help of IoT in marketing, companies can collect and exchange meaningful data with their customers. IoT enables them to create a customer database by collecting and assembling data with the help of sensors attached to smartphones, smart home appliances, vehicles, tablets, laptops, smart TVs, smart wearable devices, etc. This databases help supplement digital marketers with better marketing insights and understandings of what their customers want from them. This also enables them to create more precise digital marketing blueprints and strategies to advance in marketing by targeting a wider variety of audiences. There are many areas in marketing where IoT contributes: first being product design, IoT helps marketers interpret what quality of products their customers expect and demand. This helps them design a product suitable to the customer demands and expectations. Second, it also helps analyse customer behaviour and satisfaction. IoT can track where the customer is presently in their buying journey and clear view to classify customers on the basis of that. It also keeps a note of the purchasing patterns, market trends that impacts purchasing patterns and also location that helps marketers to customize their products accordingly. Third, IoT provides large amount of data to work with which is very helpful in understanding and knowing customer taste and preferences. There is a lot of risks involved in a brand promotion, IoT successfully reduces the risk factors and increase marketing opportunities for the marketers (Remondes, et al., 2019).

## **LITERATURE REVIEW**

IoT or Internet of Things is without any doubt the most valuable tool to understand customer insights and increases effective marketing campaigns. Keeping an insight of customer activity in their smart devices helps understand the products and services the customer maybe interested in purchasing. Smart devices store and regulate a huge amount of data which can

be used to study important insights of the customer's purchasing and reviewing patterns, this data can also tell the everyday lifestyle of the customers (Simões, et al., 2019).

The ultimate goal of the marketers is to boost sales and services of their product, this can be done by predicting when the customer needs a particular product. Thus, IoT can be used in timing of the sales and offers in order to increase their profit margins. But one must keep in mind that increasing sales must be done without sacrificing customer experience, this achieved easily by personalization of their services and products. Personalization of the products means, the product is made in a way to reach, connect and engage with different strata of the society (Tudor, et al., 2021).

IoT is doing a phenomenal job in marketing automation, normally gathering and collecting data manually took huge amounts of time and patience but with the introduction of IoT effective management of data has become an easy job. Further, the data provides sufficient and necessary information to run automated campaigns by its own, so, the marketers have minimum job left. Marketers have been freed of the extreme workloads they had to face in earlier generations to collect, gather and making databases all on their own. Thus, today's marketers are different than the marketers few decades ago, one can say IoT has changed the definition of marketers and gave us a new meaning of the term.

Previously, marketers were people who used to interview and talk with their customers verbally to know their experiences, behaviours and desires in order to improve the services and products (Rong, et al., 2016). Present day marketer is person, who analyses and studies the information gathered in the databases by IoT. They then spread their learning to the company and the company then makes the necessary customizations. Human to human interaction in boosting sales and services has reduced significantly in the past decades. IoT by definition works without any human to human or human to device interactions, it can connect and exchange data hassle-free automatically by its own (Pflaum, et al., 2018).

In the last few years, there has been an increasing trend of customer demands regarding faster deliveries, faster results and smoother transitions. Customer delight has to be taken in consideration in order increase sales of the products and services, IoT is supplemented with other automated tools like AI and other new technologies that can not only collect and store data but also read and analyse it to come up with faster solutions to modern problems. In this era of digital transformation, everyone expects and demands faster everything. Old traditional methods cannot keep up with the pace today's world is moving with, thus adaptation and improvising with current technologies becomes a must (R Tech, 2018).

Most of us have already know the use of IoT in our daily lives in smartphones, laptops smart TVs, etc. but one may not expect IoT to work in the following devices such asHVAC, language and voice assistants, iWatch, Google Glass, Fit Bit, lighting controllers, lawn/gardening appliances, smart energy meters, home air/ water quality monitoring devices, infotainment deliveries, smart switches, AI based digital technologies, smart home security devices. All of the above devices have some use of IoT (Kardaras, et al., 2019). It may seem impossible to believe for the general public that we use IoT so extensively and rigorously.

Some may call it an over reliance on IoT but it's not the case at all, moreover it's the other way round IoT has made it possible to have such devices work they do.

Without IoT many devices mentioned will not be anywhere nearly as effective as they are currently, so IoT serves to growth and innovation in technology more than we might believe. To help you make a realistic idea of how IoT functions in such devices, we can break the major components of these devices that uses IoT directly. The following are the breakdown of the components: sensors, gateways, cloud databases, middleware, firmware and protocols, all of these technologies use IoT to function. IoT sensors, sensors and protocols are used heavily in tuning of such devices. IoT firmware is usually coded in python, node.js or C in these devices. The cloud databases of IoT can be classified into transformation as a service (PaaS) and Infrastructure as a Service (IaaS) (Arkhipova, et al., 2018).

There are multiple IoT service providers such as Thingspeak, Thingworx, Ubidots, Konekt, Xively, IBM Bluemix, Azure IoT, Carriots, AWS IoT, TempoIQ, etc. Keep in mind that all these providers are extremely divided and offer different services in terms of security, safety, features, functions and technicalities. One should not think that all the service providers provide the same thing with different names, some the names mentioned here are also open-source providers and others have to be purchased. This makes it important to choose from the right service provider suitable to your needs and demands.

One must prioritize their needs based on security and authentication, data brokers and queueing, administration, supporting and running of protocols like HTTP, MQTT, CoAP, etc., data collection, data analysis, data visualization and representation capacities, integrability with other devices, scalability, support of Web Socket APIs for real time data flow before leaning towards a service provider (E. Sola, et al., 2021).

The generation born in this digital era understands and value security and safety of information more than millennials, they know that technology should advance with sacrificing of people's information and data. Thus, it automatically makes it important to have a system where security and safety is of utmost value, Blockchain in IoT ensures that all the data the IoT gathers and stores is not being used to for illegal activities in the name of marketing. Deployment of blockchain can be done cheaply in our homes, which works as a secured layer between gateways and devices that constantly check for any data breaches and suspicious activities without affecting the written code. Presently, people are not educated and aware about the functions of blockchain in ensuring safety when dealing with IoT but with the advancement of time, slowly but surely blockchain will play in bigger role in ensuring security to us as IoT in networking continues to grow.

Recent business models, like dynamic renting in Airbnb has given us an idea of proper implementation of blockchains to reassure our safety. Their marketing strategies of their services with blockchain has made it a revolutionary step towards implementation of blockchain at massive scale (Rizvi, 2017).

IoT in smart homes have been seen operability issues, since the protocols keep breaking between the devices and IoT. This has hampered the usage of IoT in smart home appliances

and hindered its growth. But as technology is improving, adapting to suitable situations, more computing and devices adjusting to lower power supplies, usage of home appliances will soon be used on a daily basis in our lives. Home appliances is a big space to capture for marketers and having IoT implementation on it makes marketing even more effective and customer friendly (Constantinescu, 2019).

There has been a massive data surge that going, so it becomes naturally important for the digital marketers in implementing more stringent and strict rules in regards with security and safety of the user. New technologies are being invented to account for any possible data breaches like encryption, authentications and blockchains. According to CISCO, by the end of 2020, the total data generated will be more 1 trillion GB. Effectively manage and assuring security of such humongous data becomes a challenge for the coming ages. IoT is inherently made to optimise and customise social media according to user needs.

Different communities and groups in social media can be potential buyers of the services and products shortly, that's why collecting data from social media and communication sites is also necessary. A digital marketer has the job of converting leads into potential buyers. One problem with IoT in social media is that digital marketers can also bombard customers with personalized messages and ads which can be very irritating. Such issues should be taken in care by the agencies employing marketers (Colella., et al., 2021).

## **OBJECTIVE**

1. To find different roles of IoT in marketing transformation.
2. To find the impact of IoT in marketing transformation.

## **RESEARCH METHODOLOGY**

A sample of 393 people was surveyed with the help of a structured which was specially designed for the present study. Respondents were from the marketing sector and had shared their opinion about different role of Iot in marketing and its impact on marketing transformation. The study is qualitative in nature and the data collection method used was random sampling. Statistical tool called multiple regression was applied to get the end results of the study.

## **FINDINGS**

Table 1 is demonstrating the general profile of 393 people that were surveyed to conduct the study in which 55.7% are male and 44.3% are female. Among them 32.3% belongs to age group 26-35 yrs, 38.9% are from the age group 35-40 yrs, and rest 28.8% are above 40 yrs of age. 24.9% of them are working as marketing managers, 28.7% as senior marketing manager, 24.7% as analysts, and 21.6% in other marketing sectors. 44.0% of the respondents are working from 0-6 yrs in the marketing sector, 31.5% are having a working experience of 6-10 years, and rest 24.5% are in the marketing field for more than 10 years.

**Table 1 General profile of the respondents**

<b>Variable</b>	<b>Respondents</b>	<b>Total %age</b>
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<b>Gender</b>		
Male	219	55.7
Female	174	44.3
<b>Total</b>	<b>393</b>	<b>100</b>
<b>Age</b>		
26-35 yrs	127	32.3
35-40 yrs	153	38.9
Above 40 yrs	113	28.8
<b>Total</b>	<b>393</b>	<b>100</b>
<b>Occupation</b>		
Marketing manager	98	24.9
Senior marketing manager	113	28.7
Analyst	97	24.7
Others	85	21.6
<b>Total</b>	<b>393</b>	<b>100</b>
<b>Work experience</b>		
0-6 yrs	173	44.0
6-10 yrs	124	31.5
More than 10 yrs	96	24.5
<b>Total</b>	<b>393</b>	<b>100</b>

**Table 2 Role of IoT in marketing transformation**

<b>Sl. No.</b>	<b>Role of IOT in marketing transformation</b>	<b>Mean Value</b>
1.	IoT is doing a phenomenal job in marketing automation, normally gathering and collecting data	3.79
2.	IoT can be used in timing of the sales and offers in order to increase their profit margins	3.61
3.	IoT is used in personalising the advertisements as per consumer's preferences	3.63
4.	IoT are used by the digital marketers to target their customers with their promotional messages	3.76
5.	IoT is used to share the information to relevant audience intelligently	3.99
6.	IoT is helping the marketers in creating automated posts through social media platforms	3.95
7.	IoT is helpful in automating the marketing processes	3.82
8.	IoT is empowering some particular business models	3.89
9.	IoT is delivering some tailored experiences to their customers	3.88
10.	IoT is helpful in reducing in marketing operational cost and opening new business opportunities	3.62

DV	Overall impact of IOT in marketing transformation	3.78
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Table 2 is showing different roles and mean values of Iot in marketing transformation. It is observed from the table that IoT is used to share the information to relevant audience intelligently with the mean score 3.99 and IoT is helping the marketers in creating automated posts through social media platforms with the mean score 3.95. The respondents say that IoT is empowering some particular business models with the mean score 3.89 and IoT is delivering some tailored experiences to their customers with the mean score 3.88. It is also found that IoT is helpful in automating the marketing processes with the mean score 3.82 and IoT are used by the digital marketers to target their customers with their promotional messages with the mean score 3.76. IoT is doing a phenomenal job in marketing automation, normally gathering and collecting data with the mean score 3.79 and IoT is used in personalising the advertisements as per consumer's preferences 3.63. The respondents believes that IoT is helpful in reducing in marketing operational cost and opening new business opportunities with the mean score 3.62 and IoT can be used in timing of the sales and offers in order to increase their profit margins with the mean score 3.61.

### Analysis of Multiple Regression

Table 3, 4, and 5 shows the relationship of the 10 independent variables and 1 dependent variable which is "overall impact of IoT in marketing transformation."

**Table 3 "Model Summary"**

"Model"	"R"	"R Square"	"Adjusted R Square"	"Std. Error of the Estimate"
1	.806 <sup>a</sup>	.649	.640	.49609
a. Predictors: (Constant), marketing automation, normally gathering and collecting data, timing of the sales and offers in order to increase their profit margins, personalising the advertisements target their customers with their promotional messages, share the information to relevant audience intelligently, creating automated posts, automating the marketing processes, empowering some particular business models, delivering some tailored experiences to their customers, reducing in marketing operational cost and opening new business opportunities.				

The Value of adjusted R square is 0.640, which means that the model explains around 64% of the variation. Table 4 shows the values of ANOVA, which is significant (sig. value below 0.05) which reflects the impact of independent variables is significant on dependent variable.

**Table 4 "ANOVA"**

"Model"	"Sum of Squares"	"df"	"Mean Square"	"F"	"Sig."
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1	Regression	173.727	10	17.373	70.590	.000 <sup>b</sup>
	Residual	94.014	382	.246		
	Total	267.740	392			
a. Dependent Variable: Overall impact of IoT in marketing transformation						
b. Predictors: (Constant), marketing automation, normally gathering and collecting data, timing of the sales and offers in order to increase their profit margins, personalising the advertisements target their customers with their promotional messages, share the information to relevant audience intelligently, creating automated posts, automating the marketing processes, empowering some particular business models, delivering some tailored experiences to their customers, reducing in marketing operational cost and opening new business opportunities.						

Table 4 presents the value of ANOVA and F value. The value in the significance column of the table 4 is .000 which means that one or more variables are significant on dependent variable. The impact of independent variables on dependent has been explained in the table 4.

**Table 5 “Coefficients”**

“Model”	“Un standardized Coefficients”		“Standardized Coefficients”	“t”	“Sig.”
	“B”	“Std. Error”	“Beta”		
(Constant)	.158	.178		.887	.376
Marketing automation, normally gathering and collecting data	.088	.034	.089	2.567	<b>.011</b>
Timing of the sales and offers in order to increase their profit margins	-.162	.043	-.179	-3.767	<b>.000</b>
Personalising the advertisements	-.015	.054	-.016	-.285	.776
Target their customers with their promotional messages	.296	.067	.304	4.397	<b>.000</b>
Share the information to relevant audience intelligently	.325	.070	.323	4.637	<b>.000</b>
Creating automated posts	.190	.058	.184	3.281	<b>.001</b>
Automating the marketing processes	-.136	.056	-.137	-2.414	<b>.016</b>
Empowering some particular business models	.183	.047	.204	3.853	<b>.000</b>
Delivering some tailored experiences to their customers	.026	.034	.027	.772	.441
Reducing in marketing operational cost and opening new business opportunities	.144	.055	.145	2.637	<b>.009</b>
a. Dependent Variable: Overall impact of IoT in marketing transformation					



Table 5 shows that out of 10 variables, 8 variables namely Marketing automation, normally gathering and collecting data, Timing of the sales and offers in order to increase their profit margins, Target their customers with their promotional messages, Share the information to relevant audience intelligently, Creating automated posts, Automating the marketing processes, Empowering some particular business models, and Reducing in marketing operational cost and opening new business opportunities shows significant impact of IoT in marketing transformation as the value in the significant is below the significant value (0.05) and the variables namely Personalising the advertisements and Delivering some tailored experiences to their customers has no significant impact of IoT in marketing transformation as the value in the significant column is above (0.05).

## CONCLUSION

IoT is allowing the digital marketers to collect and gather customer's behaviour, purchasing patterns, location and other information like it was never done before. Previously, the efficiency of contextual marketing was limited to only telephonic conversations or verbal reviews that marketers had to take from customers in order understand their needs, behaviour, desires and expectations. But now IoT can collect so much data about the user that it becomes easy to track even time when the customer can be interested in purchasing their services and products. This was marketing becomes more relevant than it ever was (Polat, 2021).

IoT also helps in building deeper insights of the customers buying cycle, making marketing more effective without causing any irritation to the customers. Earlier marketers were seen as people who like to bother people in order to gather information, today's marketers or so-called digital marketers do not carry that image of being repetitive and bothersome. Digital marketing now has the capacity to deliver their advertisements and messages both online and offline to their customers without taking up their valuable time, they're shown automated messages when they are genuinely interested in purchasing their products. Let's take a real-life example, suppose a person goes to an ecommerce site to find out the specifications a laptop is offering based on their budget. The browser's cookie automatically stores the information about that user and uses it send personalized messages of the available laptops suited to their need through emails or website notifications. This makes purchasing easier for the customer and this helps boost the sales of the products (Kannan, 2017).

The study concludes that there are different roles of IoT in marketing such as marketing automation, normally gathering and collecting data, timing of the sales and offers in order to increase their profit margins, personalising the advertisements target their customers with their promotional messages, share the information to relevant audience intelligently, creating automated posts, automating the marketing processes, empowering some particular business models, delivering some tailored experiences to their customers, reducing in marketing operational cost and opening new business opportunities. It is also found that there is a significant of IoT in marketing transformation.

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