Applications of Artificial Intelligence for Efficient Customer Relationship Management

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Abstract— Machine learning and artificial intelligence (AI) make it possible for organizations to make more efficient use of the data they already possess and to find answers to challenging challenges. Both of these capabilities enable businesses to grow their operations in a timely manner while minimizing the associated costs. Within the realm of customer relationship management (CRM), artificial intelligence (AI) and process automation have emerged as two of the most sought-after breakthroughs in recent years. This is due to the fact that companies put in a much greater amount of effort to ensure that their consumers are completely and utterly satisfied (CRM). The purpose of artificial intelligence in customer relationship management (CRM) is to reduce the amount of monotonous and repetitive work that employees are required to perform. This is accomplished by analyzing typical operations and releasing staff to concentrate on tasks that are more significant and demanding. Using artificial intelligence (AI), customer relationship management software has the potential to streamline and automate a wide range of labor-intensive activities. These responsibilities include following up with customers, sending thank-you notes, arranging appointments, and maintaining calendars. When artificial intelligence (AI) is integrated with conventional customer relationship management (CRM) systems, it is believed that AI will improve customer experience, procedures, and team productivity. Additionally, AI will boost the number of leads that are created and the visibility of those leads. When it comes to customer relationship management, the objective of artificial intelligence is to accomplish more than simply collect data; this has the ability to boost sales and ensure that existing customers continue to be delighted.

Keywords— Artificial Intelligence, Machine Learning Techniques, Customer Relationship, Management.

I. INTRODUCTION

This section explores the significance of AI in customer relationship and management, as well as its notable features. According to Salesforce, AI-enabled customer relationship management systems are projected to significantly boost global production by over 1.10 quadrillion dollars and create employment opportunities for over 800,000 individuals by 2021. Analysts predict that the global CRM industry will experience a steady annual growth rate of over 14% in the coming four years. AI-powered customer relationship management (CRM) solutions are gaining popularity among businesses due to their proven benefits. With the growing popularity of data analytics, AI has become a common feature in customer relationship management systems. With the application of artificial intelligence (AI), we can now proactively anticipate and cultivate leads, streamline repetitive tasks, and uncover previously unnoticed operational defects and patterns. This is expected to streamline and enhance the current system to enhance customer satisfaction and boost revenue. The advancement of customer relationship management systems powered by artificial intelligence is expected to be further supported by enhancements in machine learning and natural language processing technology. By enhancing these resources, we can generate more precise forecasts regarding revenue, prospects, and customer retention. When it comes to consumer segmentation, streamlining lead management, and enhancing customer engagement, utilizing an AI-driven CRM

can be highly advantageous. Employees are expected to increase their transaction efficiency with the help of AI-enabled CRM. This tool offers valuable insights and advice based on a thorough analysis of successful and unsuccessful deals. This is anticipated to enable employees to complete a greater number of transactions than ever before. AI-enabled CRM has the potential to provide employees with valuable insights, making their daily tasks easier and improving corporate sales and customer satisfaction by leveraging historical data on leads and deals.

It should not come as a surprise that customer relationship management (CRM) solutions are a good approach for organising and storing data about clients. CRM stands for customer relationship management. On the other hand, we anticipate that they will do far better than that today. It is now widely accepted that CRM cannot function well without the assistance of AI and ML. The packages offered by many of the industry's most reputable CRM service providers already include these features by default.

Suggestion is a data enrichment tool that is included in SugarCRM. It does things such as look up missing client information so that it can be filled in, set up real-time alerts for emails and push notifications, and provide you with helpful information that can help you find upsell and cross-sell opportunities. Hint is able to identify a contact's company website, social media accounts, annual income, and press coverage using only their name and email address as the only required information.

Following in its competitors' footsteps, Creatio (formerly known as bpm'online) promotes the advantages of its artificial data enrichment capabilities as a way to boost production while simultaneously reducing the need for human data analysis. Built-in AI and ML algorithms make advantage of data enrichment in order to complete contact details, recognise patterns and trends, anticipate customer wants, and automate predictive learning models.

On the other hand, these two CRMs aren't the only ones that place an emphasis on machine learning. Machine learning capabilities may be found in several platforms, including Zendesk, Salesforce, Microsoft Dynamics, Zoho, and Marketo.

What happens if, despite this, your customer relationship management system does not have any of these components? Is it possible that your organisation might still benefit from machine learning technology?

The Customer Relationship Management system (CRM) can have additional functions and connections added to it. You might want to shift gears and ask yourself whether you should consider making a change in your customer relationship management system if you're interested in deepening your use of machine learning but don't yet have an intelligent customer relationship management system. You should do this if you don't already have one.

In the end, you will want a flexible system to adjust to your business's ever-changing requirements. In the event that customer relationship management software does not advance, your investment will be rendered obsolete. When you first start using your CRM in unconventional ways, it is essential to keep this fact in mind.

A. How important AI is:

Robots in the workplace and intelligent home appliances are just two examples of how artificial intelligence has long been used as a metaphor for the future. Well, the future is today. AI is sometimes defined as intelligence demonstrated by machines instead of "natural intelligence," which is demonstrated by people and other animals. Numerous technology

providers envision the long-term development of AI to encompass machine learning, knowledge, perception, planning, text analysis, voice/speech recognition, reasoning, and the ability to move and manipulate objects.

Machine learning makes use of both previously collected data and newly observed patterns in order to identify patterns in your data and explain the connections that exist between the various data points. This information is crucial for developing a plan for anticipating sales, maintaining relationships with existing customers, and finding new business possibilities.
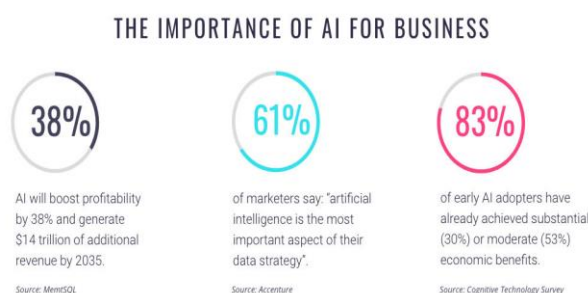

Figure 1. AI Business Use Cases (Image Source: The Keenfolks)

The application of AI has the potential to be of enormous assistance in the accomplishment of either objective (AI). Even though artificial intelligence (AI) is most commonly associated with chatbots and product recommendations, it can also be utilized to improve a company's marketing efforts and transform the company into a very intelligent and future-proof organization. This is despite the fact that AI is most commonly associated with product recommendations and chatbots.

II.   LITERATURE WORK

The use of AI-based strategies to increase revenue has already contributed to 2019's promising start. The year 2018 marked the beginning of the AI sales revolution, although the technology was still in its infancy and had significant limitations at the time. According to research conducted by Pactera Technologies and Nimdzi Insights in 2017, artificial intelligence was utilised by 51% of businesses in some form. In 2018, there were just a 2% increase in the number of people who accepted it, bringing the total to 53%.

Throughout the course of this year, there will be a discernible increase in the application of AI in sales departments. It is anticipated that the use of customer relationship management systems, or CRMS, would have a significant influence. For a very long time, customer relationship management systems (CRMs) battled to win over the hearts and minds of salespeople. A little less than a third of businesses state that more than 80 percent of their employees are familiar with and make use of the customer relationship management software. In the coming year and beyond, we will witness the combination of AI and CRM. Even older CRM systems will benefit from this upgrade by being more resilient and functional than they were previously.

The form of intelligence that computers can demonstrate is referred to as artificial intelligence (AI), and it differs from the form of intelligence that humans are capable of possessing. Multiple intelligent machines that collaborate with one another to accomplish goals and gain awareness of their surroundings are the building blocks of an artificial intelligence (AI) system. According to Russel and Norvig (2016), the term "artificial intelligence" refers to the capacity of machines (such as computers) to think and feel in the same way that humans do. In order to make progress in the field of artificial

intelligence over the course of the past few decades, it is abundantly clear that experts have devoted a significant amount of their time and energy to this endeavour. There have been significant shifts as a direct result of this work, such as the widespread adoption of big data analytics and machine learning across various business and institutional settings. These shifts have occurred as a direct result of this work. These are merely two examples among many.

The majority of people, when they hear the term "artificial intelligence," automatically think of robots that are designed to assist humans in some way. This is because robots have been around for quite some time. This is due to the fact that robots have been in existence for a considerable amount of time. This is because of the fact that for the vast majority of people, the only exposure they have had to robots interacting with humans has been through fictional media. In other words, people have only seen robots interact with humans in fictional media. This is the fundamental explanation for why this phenomenon is occurring. When it is necessary to simulate the mental processes of a human being, a computer or other piece of machinery will use something called artificial intelligence. This suggests that the machine is always observing its surroundings and looking for ways to improve its effectiveness from what it finds. These are the distinguishing characteristics that AI possesses in comparison to other areas of study. It is a frustrating experience to have to repeat the same steps over and over. The use of a computer, on the other hand, will make it so that work of that kind will never again be regarded as one that is particularly laborious by anyone. The widespread adoption of technologies that feature artificial intelligence has forced people to devote a significant portion of their time to performing routine, low-level activities.

Artificial intelligence is the name given to the intelligence that may be displayed by computers (AI). It is not accurate to compare the intelligence of a machine to that of a person. Within an AI system, a multitude of intelligent machines work together to accomplish goals and acquire new information. The term "artificial intelligence" was coined by computer scientists Stuart Russell and Peter Norvig in 2016. It refers to the ability of machines, such as computers, to simulate human intelligence and emotion. It is quite clear that, over the course of the previous few decades, a great deal of effort and time has been poured into the development of AI. As a result of this endeavour, a number of businesses and sectors have begun implementing new practises, such as placing a significant emphasis on the utilisation of big data analytics and machine learning.

When most people hear the term "artificial intelligence," the first thing that comes to their mind is robots that have been built to assist humans in some way. The majority of people's only exposure to human-robot contact has been through fictional accounts, which explains why this is the case. To phrase it another way, this is the reason why it is taking place. When a computer or other machine has to behave intelligently, it uses a form of intelligence known as artificial intelligence to simulate the functioning of the human brain. This suggests that the machine is always gathering data from its surroundings in order to discover new ways to improve itself. This is the defining characteristic that differentiates artificial intelligence from other fields of study. When you do the same things over and over again, you start to get bored very quickly. On the other hand, the use of a computer will put an end to the idea that this kind of labour is challenging. Humans are perpetually relegated to performing things that are considered to be mundane as a result of the proliferation of AI systems.

Academics are in agreement that artificial intelligence has significant use in the business sector and that it is the next step toward more efficient management of contacts with customers (Kumar et al., 2020; Lokuge et al., 2020; Vignesh and Vasantha, 2019). CRM is the "result of the ongoing evolution and integration of marketing ideas and newly available data, technologies, and organisational forms" (Brynjolfsson and McAfee, 2017; Libai et al., 2020). This is because AI solutions applied to CRM help businesses better understand and analyse customer data (Brynjolfsson and McAfee, 2017; Libai et al., 2020). As a result, businesses are better able to predict (Boulding et al., 2005). (Mishra and Mukherjee, 2019).

Academics in the field of management have not discussed artificial intelligence (AI) very much during the previous two decades, even though its usage in management is increasing (Raisch and Krakowski, 2020). The most to the expansion of the AI literature has been contributed by the fields of computer science and operations research, where researchers have mostly looked at operational tasks that machines can do, and the fields of organisation and management, where researchers have mostly looked at managerial tasks that only humans can do (Raisch and Krakowski, 2020).

III.   THE ROLE OF AI AND ML IN MARKETING

A. Integrating Marketing and Technology Throughout the Customer Lifecycle:

The market for customer relationship management (CRM) software is now seeing significant growth. It is anticipated that by the year 2025, it would produce income of more than $80 million. Recent developments in artificial intelligence have spurred a significant change in the field of customer relationship management (CRM), which has always been a valuable instrument. However, recent improvements in artificial intelligence have ignited this transformation (AI).

The most advanced customer relationship management software available today should be able to easily interface with artificial intelligence. Customer relationship management systems, often known as CRM systems, are efficient tools that companies may use to collect, organise, and centralise data on their clients. The automation of communication and improvement of management both have the potential to fortify existing relationships with customers.

The daily generation of data has increased by a factor of 10, which has resulted in a shift in the standards that enterprises must meet. We need CRM software that can concurrently pull data, do analysis on that data, and make sense of it in real time so that we can make fact-based business decisions in a timely manner.

IDC and Salesforce believe that by the year 2021, AI-enhanced CRM would contribute more than $1.1 trillion to the global GDP and create more than 800,000 more job opportunities. As a consequence of this, businesses would have an upper hand in markets that are already highly competitive. Despite the fact that there is much evidence demonstrating that automated connections are risk-free, many people continue to feel frightened by them.

1. Virtual Assistant

With the assistance of AI-driven CRM, your team will be able to accomplish more in less time and with more effectiveness. They may find it easier to organise their time and do routine chores with its assistance, such as arranging appointments, talking with people, making notes, and following up.

To put it more simply, we are getting rid of all of the laborious and time-consuming administrative chores that are now in place. Next, we put the facts that we have unearthed to use in order to guarantee that practises that were previously dangerous are now totally free of danger.

Examples:

- Tools for focusing one's attention and making notes Take notes at every single one of your sales meetings. You won't have to worry about overlooking anything important because of this.
- The call analytics software provided by CRM Salesforce captures conversations, compiles transcripts, highlights significant phrases, and identifies crucial periods in time.
- Meetings and schedules can be autonomously arranged and managed using automated scheduling aids that are driven by artificial intelligence.

2. Segmenting customers and taking names:

One will have the ability to more precisely categorise your clientele with the help of an AI-powered CRM. Using sophisticated algorithms, it is possible to quickly categorise customers according to their demographics, purchase histories, as well as their likes and dislikes.

The activities that customers have taken in the past can help you forecast the actions they will take in the future. This enables you to personalise each individual's messages and experiences. You may increase the number of prospective clients you draw to your business by targeting your advertising and outreach efforts more accurately.

Examples:

- Big data enables marketers to home in on a more specific group of potential customers as opposed to casting a wide net to catch as many as possible.
- An automated segmentation engine that allows you to separate your data into particular subsets so that you can later utilise that information to create highly targeted marketing campaigns is referred to as a segmentation tool.

3. Simplify lead management:

There is a significant chance that a sales professional may fail to follow up on a lead because of either forgetfulness or an excessive amount of work. When there are more leads, the manual sorting process takes up more time. Having said that, you throw away potential earnings whenever you pass on a business chance. You can't merely ignore potential avenues of investigation. The combination of artificial intelligence (AI) with customer relationship management (CRM) software creates a potent instrument that may be used to successfully generate new revenue. Together, these two factors make it possible for us to increase productivity without compromising the quality of our communication. There are significant repercussions that this has on lead engagement, nurturing, qualifying, and further follow-up.

The use of artificial intelligence has enabled us to fill in the crevices in our sales funnel, which had previously allowed quality leads to slip through the cracks.

Examples:

- It is possible that artificial intelligence technology might take the place of a salesman as the initial point of contact between the firm and a prospective client by communicating with them via email or text message. Once a lead has been qualified, a salesman is responsible for taking over the closing process.
- Using a variety of search tactics, inquiries from interested shoppers may be converted into sales leads.
- Using predictive analytics, accounts and contacts are rated according to the likelihood that they will make a purchase or take part in a discussion. This ranking takes place. Because of this, sales reps will likely have an easier time prioritizing the leads with the greatest quality right from the start, which will result in a stronger funnel.
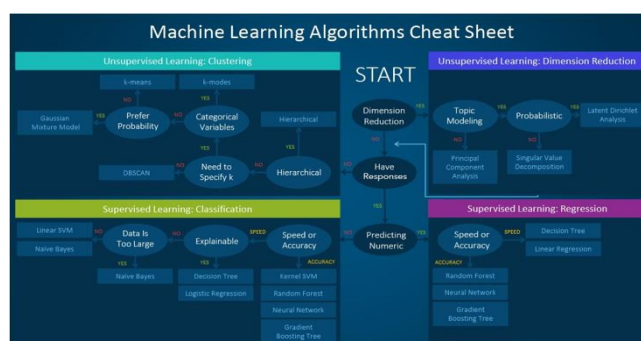

Figure 2. Shows the features of ML in CRM.

B. Real Time Examples of How AI can be used in CRM:

A relationship has been established between the marketing automation company Mintigo of San Mateo, which was first established in 2009 as a platform for predictive analytics. The latter will improve Marketo's account-based marketing solution by identifying the most promising leads and the decision-makers that are located within an organisation. The integration has the potential to cut down on the amount of time required to qualify high-value leads, to build ties between the marketing and sales teams, and to promote more natural contact with customers.
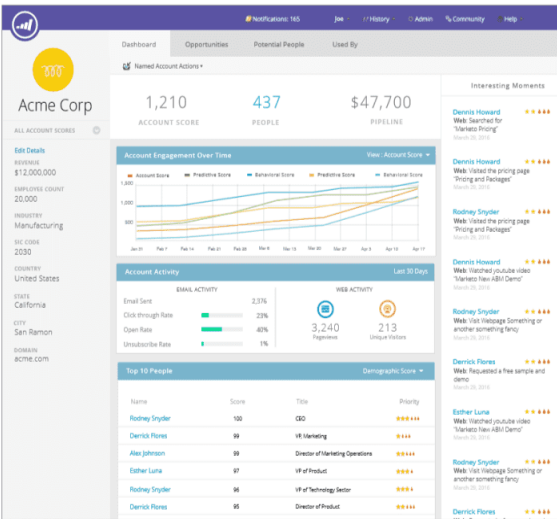

Figure 3. Test cases – Source: Mintigo

Candace is an artificial intelligence (AI) assistant, while Sugar Intelligence is a predictive analytics platform. Sugar made the announcement that it will be introducing both of these new services in the near future. The capacity of users to edit their own contact data is the major target of the features, and their primary purpose is to restrict or remove that ability. Instead, the artificial intelligence would automatically update records by merging data from customers' CRM systems with data from other sources, such as the Internet of Things.

The assistant may assist with the planning of meetings, the creation of more meaningful connections, and the handling of time-sensitive circumstances. In addition, the assistant may make recommendations for strategies to engage with customers. Candace employs natural language processing to comprehend conversations and decide what actions to do next, whereas Sugar Intelligence is an open platform that can be expanded with new capabilities. It is anticipated that the upgraded capabilities of machine learning would be delivered this year.

Figure 4. Test cases – Source: Sugar

Zia is an artificial intelligence-driven sales assistant that was recently presented as a machine learning CRM feature by Zoho. Zia is doing an investigation into the sales process in search of peculiarities in order to identify whether or not teams will be able to meet their goals in advance. Zia may advise salespeople on the most effective times to reach out to leads by phone or email, and she can do this in a variety of ways. Additionally, over time, it will learn each user's CRM routine and will provide personalised automation ideas (such as workflows or macros) to help optimise your work. This feature is only available to paid users. To put it more succinctly, Zia makes it possible for your customer relationship management system to automate itself, which is a tremendous benefit to your sales staff. Zia is part of the Zoho CRM Enterprise bundle and can be accessed there.
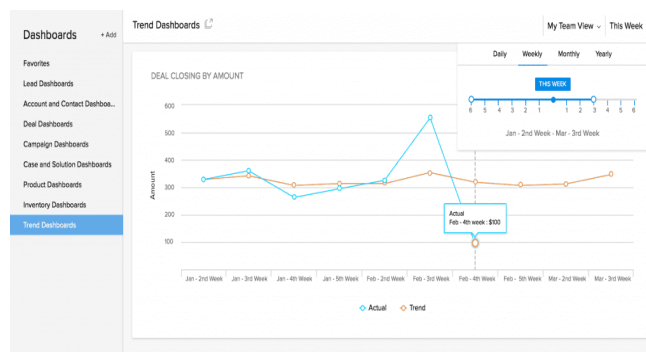

Figure 5. Test cases – Source: ZoHo

The evolution of technology has perpetually acted as a driving force in shaping business practises. The dilemma that CRM providers have been forced to face for quite some time is whether to invest in untested capabilities, which may compromise the quality of the platform they already have, or to forego such investments in favour of focusing on features that may one day define the industry. Investing in untested capabilities may compromise the quality of the platform they already have. These companies have made investments that might potentially reap benefits for both the companies and the customers of those companies sooner than we now predict.

Unlocking Data: In the past, businesses did not generate nearly as much data, and as a direct result, it was a great deal simpler to manage. It's possible that the data were obtained and entered into a database with very little effort being expended. The leadership of the organization came to the conclusion that the information that was obtained met all of their requirements, so they approved of the acquisition of it.

In contrast, recent events have significantly altered the current situation. The organization of a significant portion of the data we have on our side (unstructured data) lacks a clear pattern. The majority of the information generated by web services is in an unstructured format. In the coming years, effectively analyzing unstructured data will be crucial for organizations to achieve commercial success. This skill is crucial in assessing the degree of commercial success achieved by any organization.

Having the ability to engage in customer conversations gives corporate businesses a significant edge over their competitors. Just a few companies currently utilize AI to analyze customer conversations, seeking insights into their personality and interests to offer personalized product or service recommendations. With the advent of AI, businesses were finally able to leverage the data they had accumulated, leading to a significant transformation.

IV. CONCLUSION

Over the past few years, on-premises customer relationship management systems have become less popular. These systems were mostly used as Excel replacements and as platforms for entering static data. Customer relationship management (CRM) solutions that are hosted in the cloud and also serve as digital assistants are becoming increasingly popular among businesses of all kinds. An increasing number of people are using cloud computing, mobile devices, and social media platforms. This trend is expected to continue. In order for businesses to improve their ability to make accurate projections using data that could be accessed from a variety of devices and operating systems, it was necessary for them to have a system that would enable them to incorporate "big data" into their cloud-based customer relationship management systems. This was for the purpose of enhancing their ability to communicate with customers. CRM artificial intelligence that is powered by machine learning performs most successfully when it is presented with such massive amounts of data. The application of artificial intelligence and machine learning to customer relationship management systems has just recently begun to demonstrate the potential that these technologies possess. Business, on the other hand, will be able to provide customers with experiences that are not only more predictive but also more individualized in the fields of sales, service, marketing, and commerce in the years to come. As a consequence of this, the length of time required for the sales cycle will be reduced, the quality of leads will improve, the effectiveness of marketing campaigns will be improved, and the cost of calls to customer support will be reduced.

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