

# AI-ENABLED CHATBOT TO DRIVE MARKETING AUTOMATION FOR FINANCIAL SERVICES

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## ABSTRACT

*The purpose of this study was to determine how AI-enabled chat bots could stimulate marketing automation for financial services. Secondary data from the Consumer Financial Protection Bureau (CFPB) was utilized to identify the most frequent issues customers cited in accessing financial services, products, and information. This information was then contextualized with both the identified challenges from the literature as well as the innate benefits of chat bots. From this, it was identified that chat bots not only offers a potential to enhance sales and marketing operations by enhancing both customer understanding and personalization of customer service and service delivery, but it is also the future of service delivery. Specifically, the study identified that chat bots are instrumental in sales and marketing automation, promotion of self-service type of customer support, and ensuring digital financial inclusion and financial sustainability. Therefore, in line with the prevalent knowledge economy, which is characterized by problem solving and critical thinking, chat bots serve the need of not only addressing present-day customer centricism requirements, but also aligning the delivery of financial services, products, and information with emergent trends and pattern. They do so by ingraining proactivity in banking and other financial institutions' operations, and strategic outlook as they relate to customer experience, and product innovation.*

**Keywords:** Chat bot, Artificial Intelligence, Marketing, Financial Services, Customer Service

## INTRODUCTION

The turn of the 21<sup>st</sup> century brought about the information age marked by the development and adoption of the internet and social media. Since then, the knowledge economy has continually contributed to the rapid adoption of these technologies as well as the development and adoption of new technologies both out of the demand, and because of the novel affordances, this development brought about. Specifically, compared to the industrial age, the information age is being fueled by problems solving and critical thinking compared to rote learning that the industrial age relied on.

It should also be noted that with the increased mediation of interaction, and business processes and activities by digital technologies, this has resulted in the ubiquity of virtual interactions for both individuals and corporations alike. This has led to digital technologies becoming pools for a wealth of information. From a marketing stance, this makes digital technologies valuable for market research. This is especially considering the shift to customer orientation from product orientation, which is marked by demand being increasingly determined by value, and value is being determined by consumers (Brannback, 2011). With the availability of a wealth of data on consumers; digital technologies, social networking sites, and virtual points of contact are increasingly becoming important for sale and marketing functions as well as Research

and Development (R&D). Whereby, with the increased understanding of the needs and wants of consumers, sales and marketing teams can effectively curate sales and marketing strategies to improve marketing outcomes. In addition, R&D teams can effectively direct product innovation to ensure the development of offerings that meet the needs and expectations of the market while also forecasting emerging trends and patterns to enhance both business performance and continuity.

However, while this access to data is an advantage for businesses, increased adoption and rise of these new technologies has resulted in the exponential increase of user data and information at a rate that is difficult for humans to analyze and generate insights in real-time. Owing the centrality of problem solving and critical thinking in the knowledge economy, this has led to rise of industry 4.0, which is characterized by the development and adoption of automation, and cognitive computing technologies whereby, Artificial Intelligence (AI) and Machine Learning (ML) are other supporting and related technologies. On the one hand, AI is the simulation and augmentation of human intelligence in machines to make them think like and mimic actions of humans. On the other hand, ML is a novel approach to data analysis and a branch of AI that is grounded on precept that machines and systems can learn from data, recognize patterns, and make decisions autonomously or with little human intervention. When this is applied to marketing operations, AI and ML technologies have an innate capacity to improve both the accuracy and speed of data analysis making it possible to generate insights in real-time from the ubiquitous data sources across virtual platforms as well as digitally mediated points of contact between a business and its consumers, both prospective and existing.

Compared to human reasoning, these technologies can do routine tasks without drops in productivity or suffering from human-related setbacks such as boredom or inattention hence improving overall operational efficiency. Among the technologies that AI has contributed to their development, chat bots are one of them. They are conversational programs that imitate conversations between human users whilst acting autonomous as virtual assistants that can communicate with people through text-based platforms or on instant messaging platforms. When used in sales and marketing operations, they make it easier to reach customers and offer 24/7 customer service. This increases both engagement and access to information. They also serve as lead nurturing platforms since it is possible to continually send helpful and information messages to a client, which nurtures them to make a purchase or sign up for a service. As outlined by Escalate (2018) with messaging apps increasingly serving as a primary way for brands to reach customers, chat bots are becoming popular as they make it easy to learn more about customers and tailor marketing tactics to appeal to new and existing customers.

When this is considered within the context of financial services, Korance (2020) asserts that banks are seeking ways to reimagine customer journeys to enhance customer engagement. This has also been accelerated by the development and increased adoption of Fin tech and the generational change of its clientele. However, although banks have adopted the use of mobile apps and internet banking, these developments have limited functionalities as a customer may have to call the bank to complete some processes. However, with chat bots, customers can make their requests faster and more efficiently, while they also double as listening channels, which make it possible for bankers to better understand their consumers (Korance, 2020). As a result, chat bots make it possible to deliver personalized services such as proposing products or services that best match the situation. Operation wise, chat bots help in the minimization of human error, addressing customer requests in a timely manner, and improving customer service efficiency. However, it is key to note that a banking bot should do more than just serving as an FAQ chat bot by playing the role of a financial adviser. Hence, an ideal chat bot should have all the pertinent information the customers, about the different products and services, and intelligently generate insight from different data sets and interactions as a human would (Korance, 2020).

Hence, like other industries, banks and other financial services providers are having to adopt new technologies and enhancing their approaches to improve customer experiences. However, scaling both the reach and complexity in the provision of customer service will require more than just digitizing service delivery by developing fully enabled chat bots and virtual assistants to offer individualized and 1:1 omni channel interactions. This is because both AI and chat bots are driving marketing automation and business success through intelligent automation and conversational messaging which is contributing to scaling personalized service delivery. However, while financial service providers recognize the importance of chat bots for service delivery and replying to customer queries, three from every four providers express reservations on their capacity to implement AI in their operations (Bhaskaran, 2020). This comes in the backdrop of the fact that AI technologies have a 40 percent capacity to improve business productivity. This is because, they contribute to the revolutionization of marketing strategies while also offering businesses more chances to compete effectively (Jade, 2021). Specifically, Hall (2019) asserts that AI has the capacity to organize and inform content development. With content marketing becoming critical in digital marketing strategy formulation, AI has the potential to organize and inform content, and placing the content in front of the right people in the right platforms. Regarding content generation, AI can generate viable topics or parameters, and regarding content duration, it can help marketers determine their end-to-end content strategy while also generating reports on the performance of the different content initiatives.

Feedback is also a critical part of customer engagement but most staff only request for feedback when the process requires them to. In addition, out of the fear that the feedback offered is not usually acted upon, customers are usually hesitant to offer it. However, with chatbots, it is possible to automate customer feedback whereby, 56 percent of customers outline that conversational surveys provide an easier and natural avenue to express their opinions (Bhaskaran, 2020). This way, a conversational bot can improve the solicitation of feedback while also alerting bank managers to a problem or directing their customer satisfaction and retention strategies. Also, due to their 24/7 availability, chat bots not only enhance convenience and accessibility but they also offer opportunities for up selling and cross selling. This is because they access a client's transaction history coupled up with the increased interaction hence ingraining confidence and trust (Bhaskaran, 2020). As a result, sales agents become more responsive and they can handle more inquiries at once from the collective information pool that chat bots make possible.

Therefore, while chat bots result in cost saving and overall operational efficiency, they serve to effectively redesign customer journeys through fast responses, 24/7 availability, personalized service delivery, and meeting the goals of customers as well as improving their financial welfare (Valchev, 2019). Hence, chat bots have an innate utility for both consumers and financial services providers while also ensuring service providers are aligned to effectively meet emerging needs. Nevertheless, while consumers are increasingly demanding for chat bots, financial service providers are lagging behind in adoption. This outlines the need to identify how financial service providers are utilizing digital technologies and the factors that are serving as drivers and barriers for the adoption of chat bots. This will serve to determine the utility of chat bots in line with present day realities as well as the emerging uses and potential for driving marketing automation of finance services.

## RESEARCH AIM AND OBJECTIVES

### Aim

To provide a theoretical foundation on the utility of AI-enabled chat bots in driving marketing automation for the sale and delivery of financial services.

## Research

To determine the limitations of current digitization and automation approaches implemented by banks.

- To determine the opportunities for marketing automation for financial service providers.
- To determine how the adoption of digitization and automation approaches has contributed to service delivery.
- To outline the growth drivers for the adoption of chat bots in the delivery of financial services.
- To outline how sales and marketing strategies can be improved by the use of chat bots.
- To determine the customer-specific factors that are influencing the development and utilization of chat bots in the finance and banking industry.
- To outline the future of chat bots in the delivery of finance services and marketing automation.

## LITERATURE REVIEW

### Overview

With the rise of customer orientation, marketing is going through a revolution whereby, it is becoming more messages driven which outlines the importance of live chatting in marketing. Specifically, consumers increasingly prefer personalized service delivery, which is necessitating the move from a generic one-message-fits-all approach. As a result, for businesses to effectively meet the needs and engage with consumers there is an increasing need to ensure messages are personalized, scalable, and are delivered in real-time (Ejiofor, 2019). AI-enabled chat bots are quickly becoming the solution to address these market changes. This is because; through AI it is possible to ensure marketing automation whereby

- 1) It allows marketers to engage prospective customers that match the existing customer profiles which enable companies to come up with highly-targeted content.
- 2) Enables business to remain updated, tailor their content to its market, personalize recommendations, and offer one on one human like assistance with chat bots.
- 3) Improve efficiency whilst reducing overhead costs (Garcia, 2019). As a result, AI-enabled chat bots are becoming increasingly important in the automation of business processes. Specifically, handling customer care inquiries, marketing automation, and pushing customers through the sales process.

However, do effectively align business practices with the recent trends towards customer-centrism, it is key for businesses to identify the issues they face, how to solve them, and the objectives that inform the improvement steps (Okuda & Shoda, 2018). In the case of AI-based chat bots, they are increasingly being used to automate brand messaging and communication especially for customer support and sales. This way, AI is not only making it possible to ensure customer-centric service delivery but it is also contributing to considerable changes in marketing tactics and consumer behaviors (Davenport et al., 2020). Therefore, it is foreseeable that as AI enabled chat bots continue to develop, they will continually inform and direct sales and marketing efforts through machine learning and predictive analysis.

Case in point, Adam, et al., (2020) posits that while live-chat interfaces are becoming popular as businesses seek to provide real-time customer service, they fail to satisfy customer expectations with users becoming less persuaded to comply with requests from the chat bots. This shows that while there is utility and potential for the use of chat bots, this is yet to be attained. As such, there is a need to outline how businesses can capitalize on AI-enabled chat bots to drive marketing automation, as well as how businesses can effectively develop these technologies to ensure both customer satisfaction and business success.

## Chat Bots and Marketing Automation

As a fore mentioned, while the rise of fin tech has resulted in the increased adoption of mobile applications and the use of websites in the delivery of financial services and products. However, while the digitization has resulted in improved service delivery and the enhancement of overall efficiency in the delivery of financial services and products, these digitized forms of service delivery are limited as they do require a client to contact the bank or the financial services provider at some point during the process. The rise of industry 4.0 which is typified by the need for autonomous service delivery which is the most recent technological development is being supported by the development and improvement of AI technologies, especially Machine Learning (ML), Deep Learning (DL), and Natural Language Processing (NLP) (Thompson, 2018). This has mainly influenced services and tasks that can be automated whereby, marketing is one of them, through marketing automation. Marketing automation entails the use of platforms and technologies that serve the needs of promoting a brand and/or its offerings on multiple channels while also automating repetitive tasks.

By helping customers to complete banking transactions through a conversational format either through text or voice, banking chat bots promote marketing automation in addition to reducing operational costs and improving customer satisfaction. Regarding marketing automation, chat bots serves the purpose of automating the relationship a customer has with the bank or a financial service provider and it does this with little to no human intervention. As noted by Brannback (2011) that there is a shift to customer orientation where the value of an offering is determined by the customer, the same is evidenced in the delivery of financial services. That is, the initial digitization of service delivery and the rise the age of convenience has heightened customers' expectations of service to what is referred to as the "Amazon effect." That is, the demand for quicker and better customer service in present-day age of instant gratification.

Chat bots make this possible especially in consideration of present-day realities. That is, there is an increasing demand for mobile banking and most of the customers are already familiar with, and they prefer messaging. As such, it is outline that an effective chat bot is that which interacts intelligently with customers to enhance onboarding, selling, and to reply to customers' queries and concerns on a one-to-one basis (Korance, 2020; Thompson, 2018)). This shows that chat bots are effective in addressing the limitations faced by mobile and internet banking while capitalizing on the inherent familiarity and preference for messaging platforms for customer service delivery and interaction.

As such, while chat bots allow customers to manage their requests more efficiently and faster, they also serve as a listening channel through which it is possible to effectively understand customers. This is because, as with the case with human-mediated sales and marketing, chat bots also learn continuously about the customers which informs personalized service delivery, such as suggesting services and products that best align with a customer's needs, wants, and realities. Therefore, in the current competitive environment and the changing customer needs and expectations, there is a need to align operations with customer-centrism whilst adapting to influence of technological disruption wrought by the rise of industry 4.0 technologies (Verma et al., 2021). In line with this, AI-enabled chats bots allow for an omni-channel approach to tracking real-time data to not only evaluate, but also respond to customer requirements swiftly. This is because, due to the increased computational and cognitive power brought about by AI, it makes it possible for chat bots to generate consumer insight on customer behavior that is related to customer retention and attraction (Verma et al., 2021). Therefore, it makes it possible to determine customer expectations, which influences the determination of a course of action. This way, AI-chat bots not only redefine customer experience and service delivery, but they also serve to influence a customer's next move.

When the cognitive capacity brought about by AI is combined with the analytical capacity for big data, AI applications such as chat bots contribute in the generation of market intelligence. That is, through the combination of machine learning and semantic knowledge that AI-chat bots afford, it can offer strategic imperatives, whereby, psychologically driven and cognitive-based algorithms improve the predictability of customer behavior (Verma et al, 2021). From a psychological perspective, the overt and covert use of emotional expression promotes an understanding of the complexity consumer behavior, while linguistic patterns made possible through ML, DL, and NLP promotes sentiment predictability and the detection of context, which promotes continued sentiment classification, which improves future interactions and conversations (Verma et al., 2021).

What is more, conversational chat bots combine the underlying business rules and organizational data with an understanding of user intent. In addition, from the subsequent experiences, chat bots continue to extend its communication competencies whilst developing knowledge to personalize both message delivery and its own interpersonal communication and reaction rules (Kaczorowska-Spychalska, 2019). The result is purposeful and defined dialogue where chat bots become technological reflections of man and since human agents anticipate and reach to customer behavior, chat bots have the potential to drive marketing intelligence as they can advise buyers from the available alternatives, while also suggesting specific choices based on the needs and expectations of consumers. Therefore, chat bots improve marketing operations as they support marketing goals, techniques, and tools because of instantaneous reaction they afford sales and marketing operations (Kaczorowska-Spychalska, 2019). Specifically, they broadly understand sales processes, complaint procedures, and customer service. As a result, they serve as efficient recommendations systems, popularize, and influence content marketing and interactivity, while also obtaining sales leads. This is in addition to speeding up response times, and answering routine questions, which has positive implications for customer experience.

Compared to traditional media, chat bots promote a more enjoyable and trustful user experience because of their capacity to engage in dialogue that is more natural. That is, because of turn taking during conversations, it promotes the feeling of closeness while stimulating likeability. On the other hand, chat bots can adapt to adapt to specific consumer characteristics (Hildebrand & Bergner, 2019). Hence, due to their humanization, chat bots promote positive brand association and relationships. This is evidenced by the increased willingness by customer to trade up to costlier options, or taking on more add-on services offered by humanized chatbots which results in sales automation (Hildebrand & Bergner, 2019). Therefore, the incorporation of chat bots in sales and marketing processes promotes intimate consumer-brand relationships, stimulates brand trust, and serves as an effective opportunity for both up selling and cross selling.

*H1: Chat bots can promote sales and marketing automation by promoting upselling and cross selling.*

*H2: Chat bots automate customer understanding across contexts and interactions.*

## **Promotion of Self-Service**

While companies continue to invest heavily in customer support, most customers choose not to contact them whereby, only 5 percent of customers faced with an issue contact customer support to seek help (Tsernov, n.d.). This is a concern because unsatisfactory customer service experience is the key contributor for switching behavior that adds on to the challenges of offering customer support. Another key contributor is feeling that a brand disrespects or undervalues their time, especially when customers cannot quickly get ahold of someone with the necessary knowledge or capacity to address their issue (Commbbox, n.d.). Case in point, it is outlined that 39 percent of present-day customers expect a reply within four hours that is being thinned by the rise and

adoption of digital technologies (Tsernov, n.d). This is a key contributing factor to the rise of self-service that is characterized by a customer-initiated action aimed at solving their problems or answering their queries without needing assistance from a Customer Service Agent (CSAs) or an employee. This is critical because, 53 percent of customers will actively abandon a purchase and switch to a competitor before even considering to seek assistance from a CSA. This is because, when the existing and prospective buyers cannot find the needed answers to their questions or concerns on their own, this lack of readily available information is construed as poor customer service.

Chat bots serve as effective channels for the provision of self-service initiatives that serves to increase revenue and reduce customer frustrations. With regard to increasing revenue, it is outlined that customers who rely on self-service platforms will have a higher likelihood of making purchases of a higher average value (Commbbox, n.d.). This is because, in the process of addressing their own issues, there is a higher likelihood of coming across offerings they would need or require. In addition, this process contributes to customers becoming more knowledgeable about a company's offerings. Regarding the reduction of customer frustrations, customer who solve their issues will record higher satisfaction levels regarding their experience while rating customer service higher (Commbbox, n.d.). What is more, self-service is on the rise with 84 percent of consumers having utilized it annually, whilst 91 percent customer admit having a high affinity towards self-service channels.

To support these findings, Patil & Kulkarni (2019) assert the increased adoption and acceptance of chat bots is grounded on the time saving and convenience factors. Customers already have an already innate perception that chat bots are faster and more convenient in comparison to reaching a CSA. Moreover, the chat bots offer ease of use, usefulness, and accuracy that further support their positive evaluations. By extension, most users are increasingly finding chat bots user-friendly due to the customization and personalized of both customer service and information access. This is supported by Sarbaidya & Saha (2020) who outlines that among the factors supporting the feasibility of chat bots in the delivery of customer service is their capacity to assist user to navigate to the information they need without requiring as many clicks which reduces the needed time. By extension, this enhances both social relationships and emotional bonds with customers because of increased confidence in both the company and the chat bots. In this regard, by promoting self-service, chat bots are revolutionizing customer-centrism, which is enhancing both customer service and access to technologically mediated banking services and products. Finally, there exists a relationship between application satisfaction, personalization, and purchase intention (Twivedi, 2019).

*H3: By promoting self-service, chat bots promote customer experience and increase the potential for personalized service delivery.*

## **Promotion of Financial Sustainability and Inclusion**

With more people having phones than bank accounts, mobile phones and other digital technologies have a potential to serve as tools for digital financial inclusion. This is critical for underserved and excluded populations. However, ensuring this level of inclusion requires increased marketing by ensuring an understanding of the needs and financial circumstance of these populations and not only developing services that align with these, but also aligning service delivery to these realities (A-Buahin, 2019). Therefore, under ensuring digital financial inclusion, banks and other financial service providers should deliver unmatched customer experience and engagement on digital spaces while also ensuring timely delivery of the services and products. In line with this, it is also important for banking institutions and other financial services providers to understand that trust

is only earned through continuous engagement whilst engagement is attained through the consistent implementation of marketing strategies, and collectively they influence perceived and experienced customer experience (A-Buahin, 2019).

As such, AI-based banking systems are outlined to positively enhance digital financial inclusion by enhancing access to financial services and products to low-income earners, the impoverished, and other marginalized groups. That is, through chat bots, it is possible to address the issues of information asymmetry, and inadequate customer support and helpdesk that have contributed to financial exclusion of vulnerable and minority groups (Mhlanga, 2020). That is, by doing away with service delivery and information access barriers, it is possible to ensure these underserved and excluded populations become financially active. What is more, there is a tendency for customers to rely on chat bots to process small banking transactions, which outlines the importance of chat bots in ensuring financial sustainability and inclusion for the population in general (Hwang & Kim, 2021).

*H4: Chat bots promote access to financial services, products, and information, which in turn, promote digital financial inclusion and sustainability for underserved and marginalized groups.*

## METHODOLOGY

AI has taken over the world and it is said to be brilliant enough to replicate humans' cognitive functions of solving problems and learning. According to Xu, et al., (2020), AI in a financial services context promotes real-time evaluation of service scenarios to offer personalized recommendations, solutions, and alternatives to customers' problems or enquiries, including the complex issues. With the emergence of big data and the technologies that drive AI, the marketing teams in the financial services will be bolstered to understand and predict customer demands, developing personalized offers for customers, and most importantly understand customer needs and preferences to help them come up with appropriate financial services whilst enhancing service delivery.

For this analysis, we will look at how the marketing departments in financial services can automate their chat bots to ensure they understand customer needs and ensure a timely response or reaction is convened. This helps to build the relationship between customers and their respective banks. Since the AI nature of an automation system comes from the machine learning several aspects of what the customers have to say, this study relied on data from customer complaints from different banks several states in the US.

Specifically, each week the Consumer Financial Protection Bureau (CFPB) an agency of the United States government mandated to ensure consumer protection in the financial sector, collects and sends consumers' complaints about financial products and services to companies for response. Those complaints are published after a response is received from the pertinent institution, or after 15 days, whichever comes first. By adding their voice, consumers contribute to the improvement of the financial industry.

Using python programming language, the research study will build a model that ties customer complaints from a Chat bot to the specific product queries that they fall. This will in turn help the marketing team to craft quicker responses or redirect the queries to the relevant personnel. Marketing can then use this information to further enhance service delivery whilst considering what needs to be adjusted in the financial products.

Descriptive statistics of variables of the data will be analyzed, a word cloud of what is being discussed in the Chat bot, and a predictive model will be generated so that the automation of the model in the pipeline will help improve marketing and the Chat bot customization of responses.



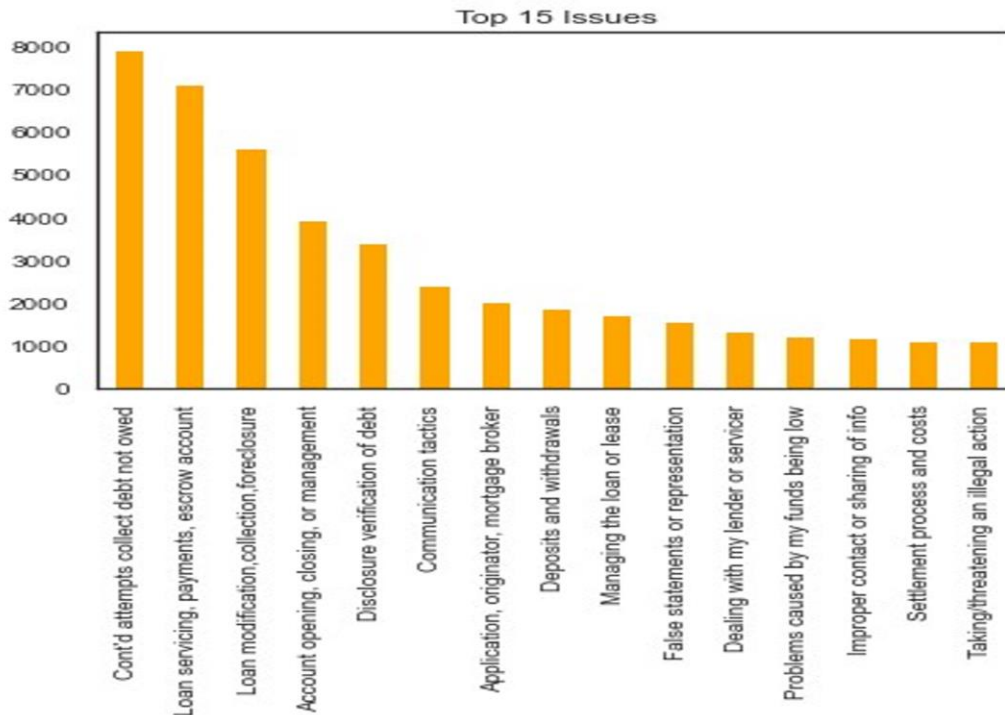
## RESULTS AND ANALYSIS

### Descriptive Statistics

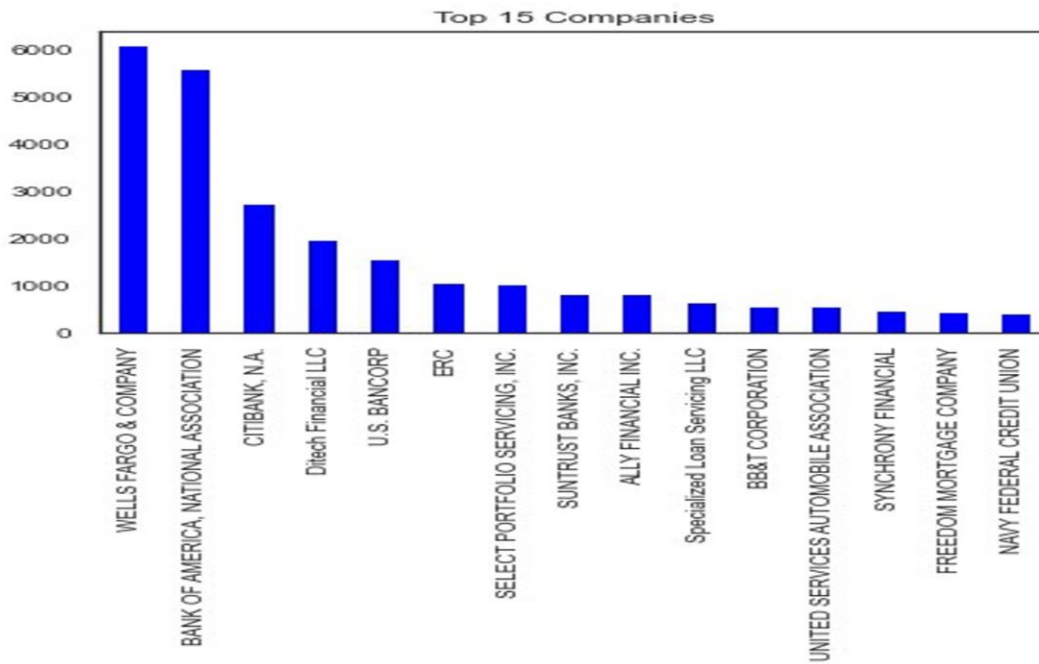
From the data, dates in which the complaints were received were recorded; the product and sub product that the customer concentrated on were recorded as well. Moreover, the underlying issues in form of a summary, as well as the complaints in form of a narrative, and the response by the financial service were recorded. The company names, the state in which they are, the response platform by the company and whatever they sent to them was also noted down. In addition, a yes or no response by the customer on whether the response was made on time and whether or not the customer disputed the response given to them was also chronicled.

After cleaning the data, about 50,000 customer complaints were collected for the analysis. Descriptive statistics highlighted the distribution of the data. According to Hanif, et al., (2010), descriptive statistics determine the core aspects of the data quantitatively.

Looking first at the top 15 underlying issues that were a concern to the customers, we can see from table 1 below that customers raised issues about loan servicing and repayments, continued attempts to collect loans not owed, loan modification and collection, account opening, closing and management, disclosure verification of debt and communication tactics. While these were the top issues, there were also concerns about communications. With this information, the bank will therefore need to have a model that gives real time responses to easy questions such as account opening, closing, and management.

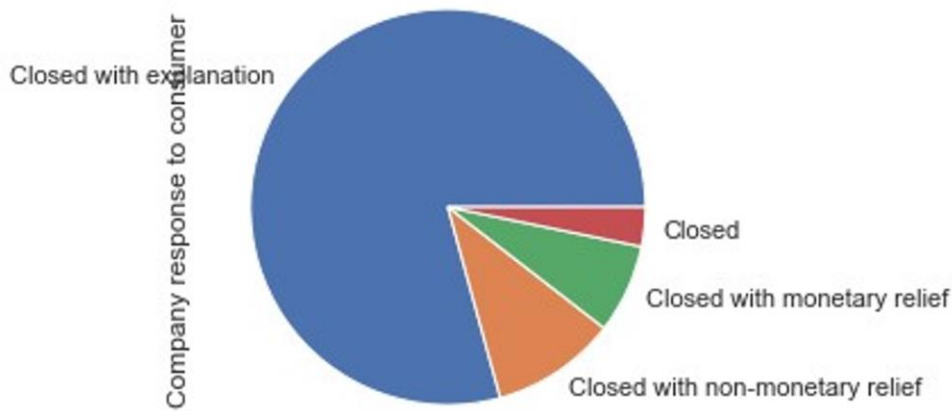


**FIGURE 1**  
**TOP 15 ISSUES**



**FIGURE 2**  
**THE BIGGEST BANKS**

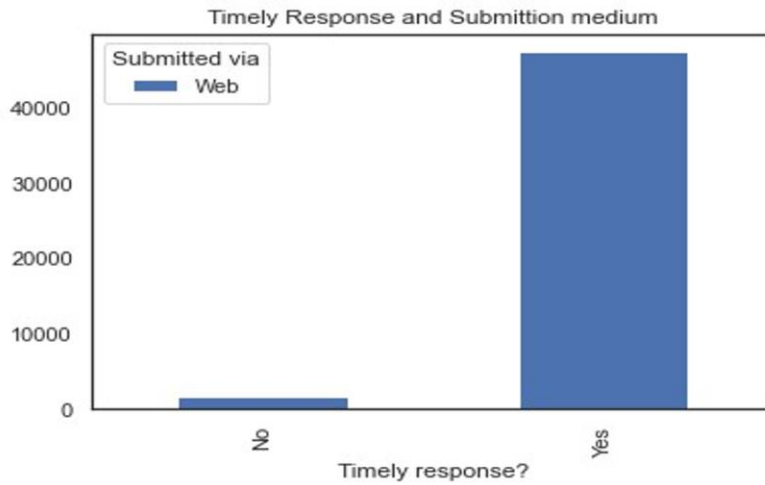
It is clear from figure 2 that the biggest banks, Wells Fargo, Bank of America, Citibank and Ditech, had the most reviews and queries raised on them because of their magnitude and the number of customer base they possess.



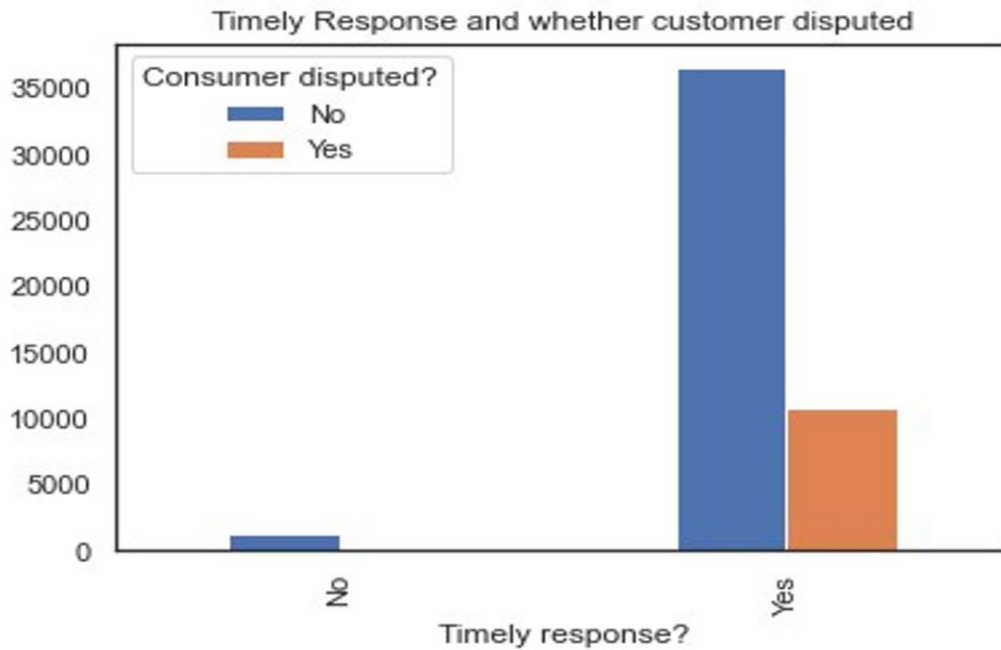
**FIGURE 3**  
**COMPANIES TO THE CUSTOMERS**

Figure 3 above shows the customized responses by the companies to the customers after the issue at hand has been resolved. More than 70% of the queries that customers had were resolved thoroughly and an explanation of the same was sent to them. This is a good gesture and results that are more accurate need to be provided by the chatbot after the model building to ensure timely and customized responses.

From the figure 4 below, the Web responses from the web to the customers are classified into timely and non-timely responses, and more than 80% of the responses were timely but that was not enough. With Machine learning and AI, the customers will be able to receive more real time responses from the chatbot that would get better and better every time it learns from more responses.



**FIGURE 4**  
**TIMELY RESPONSE AND SUBMITION MEDIUM**



**FIGURE 5**  
**QUITE A GOOD NUMBER OF CUSTOMERS**

From the figure 5 above, quite a good number of customers appreciated the timely responses from their banks but also many of them were not satisfied with the response they were given which is similar to not providing timely responses if it did not solve the customer’s issues. With AI



having issues about the banks not seeking their authorization and the word complaint, which shows how the customers were really expressing what they need corrected. The XXX value shows how sensitive account details of customers are very sensitive and the regulatory authority advocate for confidentiality.

With AI enabled, the Chat bot will be able to understand the customer sentiments and cluster them into the right product type to be able to craft the best kind of solution to the customer with great precision.

## Model

According to Dwivedi, et al., (2019), large amounts of data are streaming in every single minute in the financial institutions and it is imperative that the banks need to adapt efficiently working with AI to ensure better service delivery to their customers. To achieve this, businesses need to understand the technology architecture and support the data engineering and the machine learning teams that will build architecture and models that will be adopted by AI. The intelligent chat bot will be able to learn from different aspects and understand customer needs better over time, and this will in turn grow marketing through the automation. There are special concerns about how the financial services industry is highly regulated and some ethical issues that need to be looked at as one teaches the AI. This can be easily controlled by allowing the algorithms to learn from just specific in the pipeline that are important in driving for better service delivery.

To understand how big data collected can inform the industry, product innovation for financial services, and how the services are ear marked and effectively delivered, a model that will be run to teach the AI systems in the chat bots to give it insights into how it can better engage and interact with customers intelligently will be determined. For the model to work efficiently, high model accuracy will be considered. To consider ethical and regulatory concerns, the model will be built on the variables; Product and Customer complaint narrative. This classification model will help cluster the narratives into specific aspects that can be responded to with accuracy by the financial institutions.

A Support Vector Machine which is a classification model was used to match the accuracies, after the texts were vectorized using the Term Frequency-Inverse Document Frequency (TF-IDF). The vectorizer converts the texts into a matrix term frequency of TF-IDF features. Classification models are the most commonly used Machine-learning models because most world issues are classification problems, just as we are trying to classify the customer complaints into product types.

Model Accuracy: 91.60204081632654				
0	0.92	0.95	0.94	3523
1	0.94	0.97	0.96	3322
2	0	0	0	24
3	0.89	0.91	0.9	1697
4	0.62	0.33	0.43	54
5	0.88	0.79	0.84	360
6	0.84	0.68	0.75	733
7	0.9	0.61	0.73	85
8	0	0	0	2
accuracy			0.92	9800
macro avg	0.67	0.58	0.62	9800
weighted avg	0.91	0.92	0.91	9800

Model Confusion Matrix:

```
[[3362  49  0  35  1  25  51  0  0]
 [ 48 3224  0  39  0  3  8  0  0]
 [  4  1  0  11  0  8  0  0  0]
 [ 56  63  0 1536  9  1  26  6  0]
 [  5  2  0  29  18  0  0  0  0]
 [ 40  21  0  7  0 286  6  0  0]
 [ 122 62  0  47  1  2 499  0  0]
 [  6  0  0  26  0  0  1  52  0]
 [  0  0  0  2  0  0  0  0  0]]
```

From the model's Accuracy, Classification Report and the confusion matrix in this manuscript, we can conclude that AI can indeed leverage and enhance financial service delivery, dissemination, and development. The accuracy of 91% is quite stable and when AI chat bot system learns from the model in the pipeline, the more the chat bot will be able to deliver services accurately to customers and respond to their issues real time with less or zero disputes as this was a very important issue looking at the descriptive statistics section.

In the classification report, precision refers to the percentage of predictions that were true. A classifier would not want to label a positive instance that is actually negative. The Recall column determines the percentage of the positive cases that actually matched. Whereas the F1 Score gives us the percentage of the positive predictions that were true. The best F1 Score is a score of 1.0 and a worst score is 0.0. From our model, we can ascertain that most of the predictions had very high scores. The support column represents the actual occurrences of the class in the dataset. Lastly, the confusion matrix also measures the precision, recall, specificity, and accuracy of the model in terms of the true positive, true negative, false positive and false negative values.

## DISCUSSION AND CONCLUSION

As outlined by Korance (2020) while access to financial services has been digitized to enhance both access and efficiency, mobile, and internet banking is significantly limited which will require an individual to reach out to the bank for some issues. From the data, this can be evidenced by the finding that although banks offer significantly timely responses, not all customers are satisfied with the responses. This indicates some degree of discord between the banks' strategies to meet the demands of their customers and the demands of the customers, which is a key challenge that can be remedied through chat bots because of their marketing automation capacity. Similarly, the reduction of complaints on the weekend indicates that most of the clients try to stick to business hours and days when lodging a complain which indicates the possibility of dissatisfaction and unmet needs during the weekend. With chat bots, it is possible to enhance access by addressing this information asymmetry through 24/7- and 365-days access to information, services, and products.

As outlined by Kaczorowska-Spychalska (2019), chat bots broadly understand sales processes, complaint procedures, and customer service. As a result, they serve as efficient recommendations systems, popularize, and influence customer service, content marketing, and interactivity, while also obtaining sales leads. This is in addition to speeding up response times, and answering routine questions, which has positive implications for customer experience. Therefore, while the banking industry is faced with accessibility challenges to services, products and information, chat bots have an innate capacity to address this concern to ensure on-demand access to services, products, and information. In doing so, they can also promote upselling and cross selling by continually, matching customer needs and wants, with banking services and products.

Focusing on self-service, among the main issues raised by customers, the main ones include loan servicing and repayments, continued attempts to collect loans not owed, loan modification and

collection, account opening, closing and management, disclosure verification of debt and communication tactics. In all of these, they entail a customer accessing routine information, which can be enhanced by chat bot. Specifically, Patil & Kulkarni (2019) assert that chat bots have innate time saving and convenience attributes resulting in positive evaluations over their timeliness and convenience. What is more, they can handle multiple requests simultaneously. Therefore, through the adoption of chat bots, it is possible for banks to not only enhance service delivery, but this will also reduce the effort exerted by a client in accessing the requisite information and services. The result is the reinforcement of emotional and social bonds with a bank that are precursors for both customer satisfaction and positive word of mouth. In addition, because of the resultant trust and confidence in the bank, this is poised to promote loyalty, which is a motivator for purchasing other related services and products under the relationship between app satisfaction, personalization, and purchase intention (Sarbabidya & Saha, 2020; Twivedi, 2019).

Hence, by providing clients with an avenue to address their own concerns and seek the information they need without human interference, it is possible to enhance customer satisfaction since a customer has a higher likelihood of understanding what they want. In addition, through promoting self-service through chat bots, it is possible to enhance satisfaction by concentrating on business level aspects that support the process such as, knowledge bases, which serve to address information asymmetry.

Finally, it is in the best interests for banks to enhance financial inclusion that will not only ensure more persons are banked hence improving financial sustainability, but this will also enhance business performance and continuity. It is important to point out that since financial inclusion entails banking both excluded and underserved populations, and opening bank accounts is a key complaint received by the banks, chat bots are uniquely aligned to address this issue. That is, chat bots can readily provide all the requisite information to prospective clients on how to open a bank account, whilst guiding them throughout the process. In addition, they can serve as tools to allow clients to autonomously open a bank account. What is more, as noted by Hildebrand & Bergner (2019), the use of chat bots increases the willingness of customers to trade up to costlier options or taking on more add-on services. Therefore, through the register process, a chat bot can effectively recommend services and products offered by the bank that the client may need which enhances both upselling and cross selling. Similarly, Commbot (n.d.) outlines that this is also promoted because of the self-service approach, which offers upselling and cross-selling opportunities. However, it also provides a client with more information about the bank, and its offerings that the client can use in future engagements.

Hence, it can be outlined that while digital technology enhanced service delivery, industry 4.0 technologies are poised to ensure autonomous service delivery. Specifically, chat bots offer an avenue to enhance market automation, promote self-service, as well financial inclusion and sustainability from not only providing the needed information related to financial services and products, but also based on the needs, wants, and preferences of the clients. Hence, from the cultivated clientele understanding, chat bots are able to personalize service delivery as well as recommendations. However, there is a need to ensure that chat bots are transformed from the prevalent rule-based format that informs their delivery towards making them more conversational through effectively inclusion of ML, DL, and NLP technologies. This is because, most clients are not only familiar with, but they also prefer messaging platforms because of the increased development and adoption of messaging apps. In addition, clients are expectant of timely and complete service delivery. Collectively, the demand-level factors are influencing the need to develop and advance chat bots.

On the other hand, chat bots have the capacity to enhance service delivery and minimize operational costs, which serve as motivators for banking and other financial institutions. Therefore, as AI technologies continue to be developed, it is important to note that chatbots will only become

more conversational in an attempt to humanize them and their service delivery. Hence, since they enhance customer-orientation, it is imperative for banking and financial institutions to increase their adoption due to their innate capacity to ensure proactivity in sales and marketing of financial services and products while addressing present-day and emerging challenges.

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