Digital Marketing Automation Solutions Using AI and Intelligent Process Automation Techniques : Critical analysis and possible upcoming research

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Abstract : Artificial intelligence (AI) is revolutionizing the field of digital marketing. By leveraging machine learning algorithms and natural language processing, AI is able to analyse vast amounts of data and make intelligent decisions in real-time, enabling businesses to better understand and engage with their customers. AI can be used to personalize marketing campaigns, optimize ad targeting, and even create content. Additionally, AI-powered chatbots and virtual assistants can provide personalized customer service, improving the overall customer experience. While AI has the potential to greatly improve the effectiveness of digital marketing efforts, it is important for businesses to carefully consider the ethical implications of using AI in their marketing strategies. It acknowledges the important contribution of AI to raising customer interaction on social media. At about the same time, instances of this-capable AI-based technologies have been suggested. It was categorically claimed that institutions can act more actively and thereby improve their non-financial performance by applying AI in marketing. They see it as a tool that supports decision-making in the area of managing social media interaction. Because of its solid foundations of the distribution, democratization, cryptography, integrity, and smart contracts, distributed ledger technology is the rage right now. Its application is expanding across a number of economic areas. Due to the abundance of available data, there are concerns with big data analytics, anonymity, ransomware attacks, marketing fraud, and spam. In order to offer an areas for further research of new market possibilities for blockchain customers experience, the current study evaluates the application of blockchain in the marketing sector and aims to identify influencing factors, research streams, and research topics.

INTRODUCTION

There are numerous AI-based digital marketing solutions available, including:

Personalization: Artificial intelligence (AI) can be used to evaluate consumer data and develop personalised marketing strategies, including customised emails and social media posts.

Ad targeting: To improve ad targeting and raise the efficiency of ad campaigns, AI can examine client data and online behaviour.AI can be used to create content, including social media postings and website material, enabling organizations to scale existing content development. Chatbots and virtual assistants: Chatbots and virtual assistants that are AI-powered can offer individualised customer support by responding to inquiries and assisting clients in real-time. Sentiment analysis: AI can be employed to examine social media postings and customer reviews to comprehend customer sentiment and find areas for development.

Predictive analytics: AI can evaluate customer information, forecast future behaviour, and assist firms in creating good marketing decisions.AI can be utilised for optimization in a number of areas of online marketing, including website design and SEO. Search Engine optimization specialists will need to adjust to this comparatively recent search as more individuals start to pursue the vocal search option. Due to the differences between voice requests and ordinary inquiries, there is a challenge. Whether it's an online store or a presentation site, keywords are among the most crucial pieces of an effective SEO design, along with other factors. When a user searches for a website in a search engine, they employ keywords to find it. Basically, an optimised site must employ the same key phrases as users in the content, metatags, alt-text of images, and other areas. In digital advertising, AI is largely concerned with lead conversion and user retention. Through the use of perceptive Ai - powered chatbots, clever email marketing, responsive website designing, and other digital services, it may point users in the way that is consistent with the company's objectives. The effect of Automation on digital marketing is dependent on a number of things. A branch of AI called machine learning (ML) is focused with automated systems that access data and utilise it to learn on their own. Creating personas and understanding the customer lifecycle process have been made easier by AI. It enables brands to swiftly and simply deliver useful, unique recommendations for the different customer profiles at every level of the marketing funnel and across all channels. AI technologies in internet advertising can evaluate what content is most likely to keep users returning to the site based on historical data. AI analyses which clients would be most likely to discontinue using a particular service and which attributes are common among discontinuers. These statistics allow marketers to plan their upcoming campaigns and implementation strategies that encourage people to stick around.

LITERATURE REVIEW

Algorithmic intelligence is the ability to transfer mental abilities to machines so they can carry out activities of any complexity. Computational intelligence's goals include the ability to think, learn, and carry out tasks. Older definitions of artificial intelligence become outmoded as technological advancements. Artificial intelligence is based on three fundamental ideas. Reinforcement learning, supervised learning, and artificial neural network are some fundamental ideas. The advancement of data mining, computational linguistics, and driving software is being facilitated by these ideas. While AI and machine learning may appear to be synonymous, AI is typically thought regarded as the more general term, with cognitive computing and the other two AI ideas being considered a subset of it. Robotic process automation (RPA), the earliest type of AI, is focused on the automating of procedures by utilising linear models to resolve simple problems. RPA uses AI to support the service request mechanism, yet there is no application learning or acclimatisation. And about half of the firms surveyed (53%) have mostly begun their RPA journeys, and 19% of survey participants aim to adopt RPA over the next two years, according to a Deloitte Corporate RPA Survey.

The group conducted the critical analysis to understand the breadth of fieldwork on using AI to improve customer engagement. The integration constraints of driverless personalization were described by Gacanin and Wagner in [19]. The study also described how AI and ML were employed to construct the security apparatus and crucial commercial value generator. The study also described how automation was used to construct the security apparatus and crucial effective value generator. Artificial intelligence-driven chatbots with Text Classification enhance user experience using NLP (Nguyen and Sidorova) in [18]. Long - established grocery outlets were transformed into smart retail stores by Automation and Internet of Things. The improved logistics and smart department stores improved consumer experience and convenience of shopping (Sujatha et al) in [19].

Artificial intelligence in the administration of promotions: Publicity planning, media organizing, managing advertising campaigns, optimization of search engines etc. are all part of promotion management. Promotional strategies are shifting from being tactile to being digital. Due to global digital revolution, internet advertising and social networking initiatives gained traction. In today's technologically advanced environment, the client determines the timing, location, and content. AI provides message personalisation and customisation based on client preferences and characteristics (Huang & Rust in their proposal) in [20].

Several Automation changes for the marketing sector: Automating the search for digital security might also be done with AI. To evaluate for security holes in its solutions, software developers may employ AI in a manner akin to how thieves search for unreported exploits in enterprise systems. It is crucial to take into account the degree of openness necessary to comprehend why such an Analytics platform made a given conclusion when choosing a tool. Marketing departments may obtain a clear report on why a particular choice was made as well as which data had an influence on the selection based on the program. Artificial intelligence can be used by marketing companies to recognise patterns and project them into the future. It has proven possible to create machines that can mimic cognitive processes that are particular to the human intellect, most significantly training and problem-resolving. AI is enables marketers in understanding the constantly evolving world of brand management by interpreting user data and assisting merchants in thinking logically of user preference. Marketers can employ artificial intelligence to create content for straightforward tales like stock alerts and athletics reports. Many businesses email promotional tools are optimised by Chatbots marketing technologies. In particular, they help them decide whether customized content or product reviews send to specific portions and when to create targeted emails. AI displays the most pertinent information at the most efficient moments. This technology can help with distribution optimization, preparing for future material, retrofitting content, and finding top of the leader board content . Text analytics, machine learning, and big data have already been utilised in business.

RESEARCH METHODOLOGY

Pay-per-click (PPC) ads

This method of promoting websites involves employing sponsored content on websites like Google Adsense. Affiliate marketing entails endorsing the items or services of some other business in return for a compensation. In the payper-click approach, keywords play a major role. For instance, online adverts (sometimes referred to as affiliate links) only show up in results from search engines when a user types in a phrase associated with the good or service being offered. As a result, businesses that use pay-per-click marketing models investigate and assess the keywords that are most pertinent to their offerings or services. Spending in suitable keywords can increase click throughs and, therefore, earnings.

Autonomous PPC Bid Adjustment: You can modify your promotions when you utilise A.I. to manage your ads by making minor adjustments to the script. Your PPC campaigns will ultimately be more successful as a result of this. Utilizing A.I. to automatically change your PPC bids becomes an illustration. By doing this, you'll avoid placing a cheap price on an ad that will aid in the production of excellent leads. By doing away with overbidding, it will also assist you in enhancing your general payback.

Better Tracking: To comprehend the relationship between leads acquired by your outdoor initiatives and set programs, and in certain circumstances, even specific keywords, it is possible to utilise Important role in the etiology analytics and call monitoring software. You may optimise your remarketing efforts by analysing data from offline conversions. Use A.I. in your sponsored advertising campaigns if you want to have the greatest amount of success. This will return off and enable you to receive better value for your advertising budget. Don't undervalue the advantages of advanced analytics. Additionally, as it develops and grows, new opportunities will present themselves. To build campaigns that outperform the opposition, keep this in mind.

Application factors for Robotic Process Automation in branding

Monitoring of costs and Competitiveness: Artificial robots are capable of doing in-depth online searches to find data on potential customers and rivals. They may compile pertinent information about the ecommerce website of your company in comparison to that of your rivals across a number of websites, and even monitor trends over time. In contrast to taking an individual numerous hours to accomplish the task, it is finished in a short amount of time. The accurate data generated by bots can subsequently be used in your financial statements.

Preserving Consumer Data: It needs time and is susceptible to mistakes to manually input numerous types of sales data, classify it according on significant characteristics, and make it readily accessible throughout the organization. RPA gives quick access to information as well as unified storage systems for both residential and commercial consumers.

Streamlining the changeover to new technology from legacy applications: Explore the possibility of manually incorporating data into a newer system from a Customer relationship management system (a classic example of an information system). I'm sure that just realizing how much time it usually takes and the possibility of mistakes has made you curious to discover a better solution.

Banking Marketing Initiative using artificial intelligence algorithms

Even though bank marketing strategies have mostly kept conventional, both clients and marketers find regular bank branding to be dull. By thinking creatively and putting creative marketing ideas for banks into practise, you may create engaging campaigns that will aid your bank, its customers, and possibly even the success of its own marketing campaigns. Most people would prefer to avoid bank services if they could because they view it as a boring necessity. Adopting a creative strategy for financial institution marketing campaigns could change that, particularly if you incorporate innovative banking marketing concepts like game elements, robotics, chatbot, and reward systems to entice customers to utilise your products.

Room Marketing for Commercial banks: For instance, in 2008, Hongkong and Shanghai Banking Corporation started a campaign in Australia to raise consciousness about personal payment services. Most residents at the period were not familiar with HSBC as a company or as a personal checking account. HSBC came up with a clever marketing strategy by automating routine tasks for constructing designs on receipts. The outcome generated conversation and improved relationships for the bank. To increase attention and engagement in-person, you can also use various innovative marketing strategies for banks. Providing advice and information locally, as an illustration. To entice consumers and increase involvement, banks like Virgin Money in the UK are establishing lounge where anybody can visit and unwind. It's crucial to take quick action to move customers' attention away from clerks but towards smart self-service provided by smarter Automatic teller machines and computer equipment. Doing so will help you decrease the cost of maintaining a real presence, reduce the number of local banks, and provide more sites and better value. Since customers aren't required to sit for a bank officer, banks like State Bank of India and JP Morgan Chase are already implementing these measures, which increase bank involvement.

Customer Reward for Collaboration: Building reward programmes for ongoing participation is a worthwhile bank business strategy that will assist you in maintaining that connection. Users can receive incentives for logging into your account on Twitter or Google, for managing their finances digitally on a regular or weekly basis, and for using rewards programmes to encourage the usage of new software. You may offer rewards to users that continuously use and switch to a new mobile app, for instance. Rewards might include anything from compensating for transactions to randomised double deposits to point systems, but they must always be observable and sizable enough to encourage real behavioural changes.

In this instance, we're going to examine and make a prediction about whether customers have deposits or are likely to do so. Here we are using Exploratory Data Analysis is typically the preliminary stage when beginning an analysis of data. There are no models or hypotheses in EDA. From the data, you are extracting patterns and facts. EDA is essential for data science initiatives as it can: 1. Aid in developing your data understanding; 2. Compare different populations; 3. Verify that the data is on the expected scale; 4. Determine whether there are deviations or where data is lacking; 5. Compute the average, minimum, maximum, and variance after summing the data.

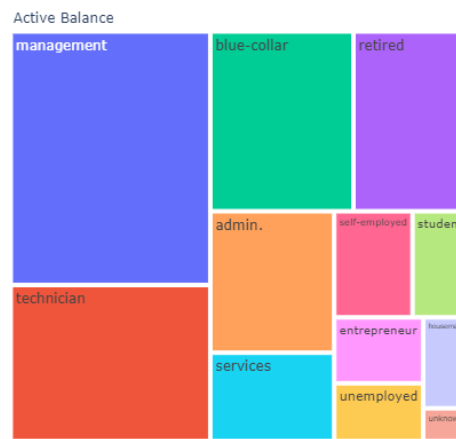The below "Fig. 1" shows that both the majority of deposit accounts and the most active balances are managed.

Fig. 1 Heatmap of customer segmentation

The below "Fig. 2" demonstrates the management behaviour on deposits they made on their respective bank accounts plotted active balance against marital status.
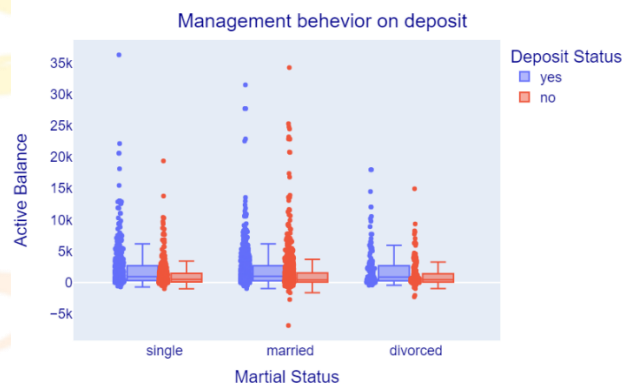

Fig. 2 Management behaviour on deposit

Marital Status: As formerly said, a divorce has a profound effect on a person's equilibrium.

Education: A prospect's level of education significantly affects how balanced they are. Loans: The candidate's current balance greatly depends on whether or not he or she has had a prior loan.

The below "Fig. 3" shows that segmenting the bank customers based on their bank balance and their maintanence to issue credit cards.
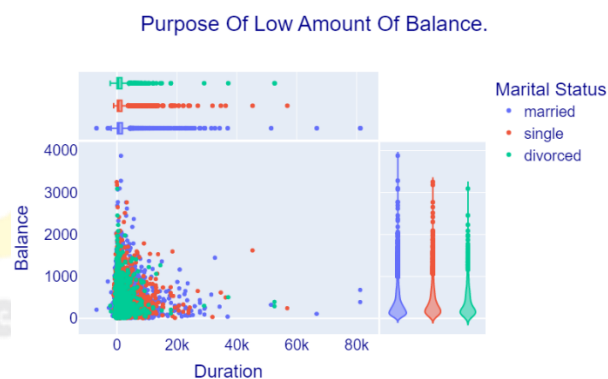

Fig. 3 Purpose of Low Amount of Balance

Categorizing credit card holders

In the upcoming financial term, Every Corporate Bank plans to concentrate on its credit card user community. Their consumer analysis team has given them advice on how to increase market dominance. The sales department suggests running customized initiatives to target both potential subscribers and current customers for upselling. The clients' negative perception of the side technical services was another finding out from market analysis. The Technical team intends to improve the method of providing services in light of this in order to guarantee that customer inquiries are answered more quickly. Using the guidance from Big data analytics and data science assistance team ,we can interact more effectively.

RESULT AND DISCUSSIONS

The below "Fig. 4" shows that Most logs either have no credit services or have credit with a very low limit. Because those people are applying for credit cards for the sake of emergency funds and e-commerce shopping as they provide huge discounts on buying with the cards.
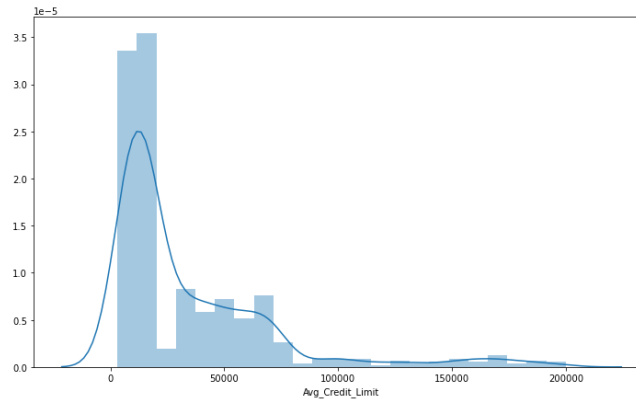

Fig. 4 People with no credit card or less limit

It appears from the below "Table. 1" that my theory about clusters grouping using K-Means clustering technique in AI along the query method has come true. If we examine the data, we recognize that there is a segment that favors using their bank's website for communication. This segment also has a significantly greater credit limit and more lines of credit than the average person. From this we observed that those people had more chance of getting personal loans,so it is better oppurtunity for bank's to target those customers. Users who value in-person contacts are more likely to possess fewer credit cards and lower credit limits. Customers that contact businesses via phone fall somewhere in between.

TABLE 1

Kmean_grouping	Customer Key	Avg_Credit_Limit	Total_Credit_Cards	Total_visits_bank	Total_visits_online	Total_calls_made
0	50	50	50	50	50	50
1	224	224	224	224	224	224
2	386	386	386	386	386	386

FUTURE RESEARCH DIRECTIONS

Future academics will face new strategic initiatives when semantic information and machine learning for deeper consumer insights are developed (Camberia, 2016). Neurologically and psychologically motivated reasoning. Algorithms should make consumer behaviour even more predictable. Intelligent sentiment mining systems will be created using a combination of engineering techniques and cognitive therapy targeting the affective and cognitive needs of consumers. Future improvements in sentiment categorization will be made possible by hybrid machine learning techniques (Tripathy et al.,) in [16].

The use of Automation in marketing will increase with the development of optimization methods based on current strategic marketing (Zhang et al.,)in [16]. AI can be used by marketers to assess customer trends and patterns, predict outcomes, and optimise advertising. To predict future trends, it makes use of data, regression methods, and cutting-edge AI technologies.

Intelligent machines learn how to improve their results and provide the best solutions over time as they study additional data. Massive volumes of past user data can be analysed by Automation ML algorithms to determine which adverts are suitable for customers and at what point of the purchase decision. By leveraging trends and data, Machine learning will provide marketers with the optimisation benefits of releasing content at the ideal time. To identify patterns in data that help you make better judgements in the future, machine learning (ML) is a technique that employs observations or data, such as firsthand experience, or instructions. On social media, interpersonal expressions are used both overtly and covertly, which increases the complexity and precision of predicted behaviour. Deep learning behavioral patterns may aid in sentiment analysis and enhance sentiment forecasting. The capacity of potential researchers would be further enhanced by the advancement of sub text and ambiguity resolution for dealing with volatile sentiment analysis (Poria et al.,) in [15]. For large data sentiment classification using Twitter datasets, future work should focus on high derivation languages and take emotive vocabulary into consideration (Giatsoglou et al.,) in [17].

CONCLUSION

In order to better comprehend its end-user experience and accessibility across all functional departments, the organization is conceptualized in the Fourth Industrial Revolution as having consolidated data about consumers and commodities across all networks and products. In order to predict and deliver informed experiences that fulfil users expectations, AI systems have been important in big data analytics.

Through all of this study, the researchers provide a comprehensive perspective on using AI to improve service quality and customer experience. Delivering consumer experiences that foster advocacy and long-term customers requires the effective use of Automation and predictive modelling. The future involves incident-based architectures coupled with Automation and predictive analytics.

Here we concluded that Banking tries to give best out of it's service to the customers by Banks have the chance to comprehend current and future client needs by analyzing personal and transactional data. The capacity to contextually offer those insights to customers is added through personalization. Increased sales targeting and effectiveness in accordance with a set corporate strategy is the most evident application of these strategies.

A high balance on a current account may demonstrate attention in a fixed deposit, daily visits to the mortgage loan information page may indicate plans to buy a home, a low balance with upcoming bills may necessitate a personal overdraft offer ,a frequent traveler may be interested in travel insurance, a fan of fine dining may value discounts at a well-known restaurant, etc.

Thanks to the data gathered and produced by its algorithms, AI enables them to swiftly decide what information to target customers with and which channel to use when. When Automation is used to customize user experiences, users are more at ease and more likely to purchase what is being offered. AI techniques can also be employed to assess the efficacy of rival efforts and uncover the intentions of their target audiences. A kind of artificial intelligence called machine learning (ML) enables computers to process and interpret data without having to be explicitly programmed. The portals used for internet promotion frequently have algorithms

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