Dynamic Artificial Intelligence in Digital Marketing

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Abstract. Artificial intelligence has been dubbed the next industrial revolution, and many people feel that it can solve many of the issues and difficulties that the world is now facing. The emergence of customization and AI-based technology has radically revolutionized how marketers can create the ideal customer experience, allowing them to better engage with their target customers. The paper showcases early narratives of AI from early 1998, 2000's till presently deployed models in industry. We have gathered some edges of AI in digital market such as personalized recommendations, automated designs and unbiased decisions. Along with some highlighted challenges faced. We have also discussed about some social media sustaining tools for improvement in content design, management, and scheduling as well as cost optimization. Further we have discussed about the future potential of AI which is unpredictable.

Keywords, Artificial Intelligence, Digital Marketing, Automated, Recommendations, sustaining tools, Machine Leaning

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1. Introduction,

In the years to come, artificial intelligence will have a huge influence on digital marketing. [1] Inevitably, artificial intelligence and machine learning will have a huge influence on digital marketing. The technologies we use every day in marketing have advanced significantly over the last decade, and the rate of change in the industry is accelerating. Many individuals think that artificial intelligence is the next industrial revolution, and that it can solve most of the world's current issues and difficulties. In the near future, AI will be able to develop whole new industries and environments. Artificial intelligence (AI) is the ability of a digital computer or computer-controlled robot to do tasks traditionally associated with intelligent persons (AI).

Human-like reasoning, meaning, generalization, and the capacity to learn from prior experience all fall under the umbrella of cognitive science. [2] We attribute intelligence to all but the simplest human behaviors, yet even complex insect behaviors are not considered to be evidence of intelligence. [3] Many issues and arguments have been sparked by the lofty objective of artificial intelligence. As a result, there is no one recognized definition of the discipline. You may monitor the success of your marketing campaigns via the usage of technological devices, such as smartphones and tablets. Digital marketing is the term used to describe marketing campaigns that are carried out using a computer, mobile phone, tablet, or other digital device. [3] There are a variety of ways this material may be provided, including online video, display advertisements, search engine marketing, paid social ads, and social network posts. Digital marketing is often compared to "traditional" marketing strategies like billboards, magazine adverts, and direct mail. As opposed to more traditional forms of marketing, digital methods allow you to target customers who are more likely to purchase your product or service. It is much less costly than traditional marketing methods, and you can evaluate your results on a daily basis, enabling you to make modifications as required. Digital marketing has a number of advantages, including the following: Focus your efforts on just those customers who are most likely to buy from you. It is less expensive than traditional techniques of outbound promotion.

As a result of digital marketing, you may compete with larger businesses in your sector. Digital marketing can be tracked and measured. Artificial intelligence (AI) has a significant role to play in digital marketing. With Amazon's Alexa, Apple's Siri, and self-driving cars on the horizon, the term "artificial intelligence" (AI) is becoming more and more popular. The truth of AI, though, is in the millions of tools and programs operating quietly in the background, automating mundane tasks or making predictions to make our lives simpler. [4] Artificial intelligence (AI) is a phrase used to describe software that can learn and improve on its own, without relying on human input. [2] As a result, machines can now assist us in tasks that formerly required humans to think and make decisions, in addition to helping us with the heavy lifting. Automated learning and decision-making processes are a fundamental part of all commercial AI systems today, and this is the driving force behind all AI systems. This has surely been put to good use in marketing! The wave of digital disruption has converted social media into a viral marketing tool for businesses during the last decade. Social media platforms and social networks have evolved throughout time in terms of how we interact with them. AI is also a driving force behind the exponential growth of social media. AI is offering ways to improve your social media presence, from tracking the effectiveness of your brand's postings to gaining insight into your audience's behaviors. Social media's increased reliance on artificial intelligence (AI) expands the potential audience for specialized products and services. AI may be used to create content, search suggestions, intelligent advertising tools, sophisticated analytics, and many other things. The use of artificial intelligence (AI) in social media may help you improve your online presence

and scale your brand's development over time, as we mentioned in this post.

Figure 1: AI transforming Digital Market [5]

2. Early narratives,

- o All of this began in 1998, when AI was merely a theoretical concept in the textbooks. On the "digital bookshelves" report at Columbia University, the idea of clustering customer behavior to forecast future behavior was first proposed. [6] Using "collaborative filtering" in 1998, Amazon was able to provide suggestions for millions of consumers. With the growing popularity of content marketing and the resulting increase in advertising potential, AI began to target the labor-intensive process of content generation as early as 2013. However, the expense and speed of effective journalism are seen as excessively sluggish in comparison to the number of advertising and audience attention that is available. [6] After analyzing billions of daily sports-related data points, Yahoo developed Automated Insight Wordsmith Platform (now Verizon's), a platform that employs artificial intelligence to create computer-generated articles summarizing games, educating fantasy sports followers, and providing facts. [7] When artificial intelligence (AI) became widely available in the advertising industry in 2014, it streamlined decision-making and lowered costs. In 2014, artificial intelligence-based ad purchasing was developed, successfully eliminating the broken, arduous human operations of researching target markets, budgets, insertion orders, and layers of extra analytics monitoring – not to mention expensive pricing. In 2015, a new evolutionary step was taken, resulting in a search result that recognizes the intent of the user. To enhance search engine results from the early 2000s, artificial intelligence has been used. [7] In 2015, Google unveiled its most advanced artificial intelligence system. Ranking Brain, which makes substantial advancements in reading search queries from fresh angles. A mathematical database of written language may now be used by Google when a search word it is unfamiliar with or without suitable context for is sent in the form of an online inquiry. [6] In 2016, artificial intelligence (AI) began to listen, learn, and act. [7] A new advertising opportunity awaits marketers as virtual assistants like Amazon Echo, Google Home, and Apple go ahead with voice recognition in our homes. In addition to Amazon's present presence in 15 million households, the company is also working to expand advertising options for brands like Clorox, Proctor & Gamble, and others on Alexa.

3. Impact of artificial intelligence in pulling the Customer Relationship Management (CRM),

Artificial Intelligence (AI) may construct simulation models and customize purchase processes via suggestions based on machine learning technologies and interactions with virtual assistants. The use of artificial intelligence (AI) in marketing is becoming more common. [8] Similar to how Amazon uses AI to suggest things based on prior purchases, views, and searches, so does Google.
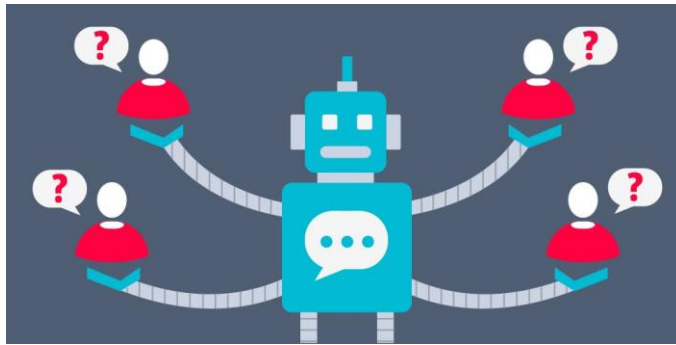

Figure 2: AI Chatbot [6]

o   Segmentation - Successful internet marketing techniques rely heavily on segmentation. [8] It is insufficient to divide an audience by age and gender. Marketers must go a step further and create segments based on preferences, interests, geography, devices, and level of interaction. Artificial Intelligence (AI) may assist marketers target particular individuals or a group of people with more precise inclinations and requirements.

o   Generating Content – Automated systems may now generate original material depending on input data. [8] These may help you save a lot of time and money. Data and information may be used by AI to generate reports and news stories. Many major news organizations, like the BBC and others, are increasingly using automated journalism.

o   Product Recommendation and Content Curation- Not only is content being created, but users' search, interest, and behaviour are being used to make product and service recommendations. [9] What is better than discovering the appropriate product or service that you are currently looking at? That is what artificial intelligence can do. Netflix knows exactly what you would like based on what you have already seen.

o   Use of AI Chatbots – [8] Businesses employ automated answers to answer client questions and gather data, which helps them keep their audience informed about their goods and services.

o   Predictive Analysis- Artificial Intelligence makes predictions based on facts. [9] Data, statistical techniques, and machine learning are all used in predictive analysis.

o Digital Advertising & Email Marketing - Adverts on platforms like Facebook, Google, and Instagram are increasingly relying on artificial intelligence (AI) to assure optimum performance. [8] [9] Advertisements tailored to the user's interests based on demographic data such as age, gender, and other factors. Artificial Intelligence (AI) is being used by brands to personalize email messages in order to reach their specific target demographic. They now have the ability to tailor information depending on the habits and tastes of individual customers.
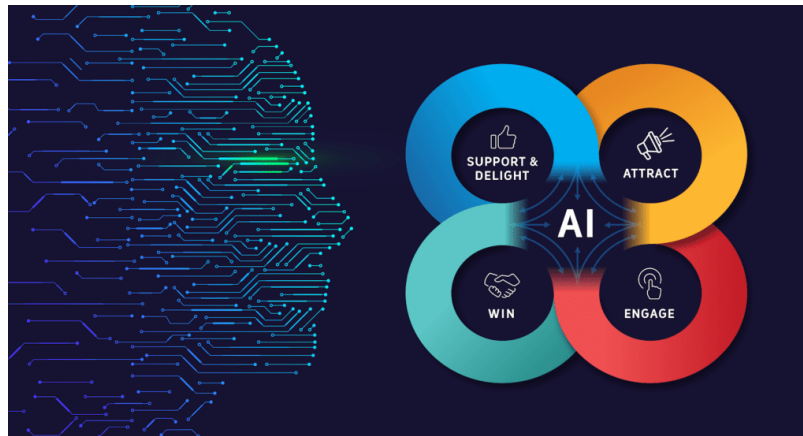
Figure 3: Edge and challenges of artificial Intelligence [12]

4. Edge and challenges of Artificial Intelligence in Digital Marketing,

4.1 Edges of artificial Intelligence are [10] [11]:

Table 1 : Edges of Artificial Intelligence [10]

Topic	Description
Cost savings	The Business Insider predicts that by 2020, 85 percent of consumer transactions will be handled without human intervention.
Personalization of products	Identification of prospective clients based on data such as demographics, geography, and past purchases is a part of this process. The items themselves may be tracked and consumer data is collected.
24x7 Availability	Several studies have shown that individuals are most productive between the hours of 3 and 4. Humans, like all other creatures, need rest and recreation in order to maintain a healthy work-life balance. AI, on the other hand, is able to work nonstop.
Unbiased Decisions	Even though we may not like it, we are all influenced by our emotions. Artificial Intelligence (AI), on the other hand, is emotionless, practical, and logical in its approach.

4.2 Challenges faced while using [10] [11] Artificial Intelligence in social media platforms:

Table 2:
Challenges
faced while
using [10]
[11] Artificial
Intelligence in
social media
platforms

Customers don't always like chatbots or even talking to computers on the phone	Chatbots that are not very competent might make it clear that there is no one on the other end. Certain individuals (particularly those from older generations) may feel quite uncomfortable in this situation.
Algorithms can be wrong	Even if a computer is incorrect, it is difficult to fathom. And although they may be correct in terms of mathematics or formulae, people are much more complex than that.
High Costs	Making a computer capable of simulating human intellect is a huge accomplishment in itself. A lot of effort and money are required, and the results may be rather costly.
Increase in Unemployment	Artificial intelligence has the unfortunate side effect of automating a large number of routine tasks.
No Ethics	When it comes to ethics and morals, artificial intelligence (AI) frequently has difficulty. Some have expressed concern that AI might one day develop out of control and wreak havoc on the human population. This tipping moment is referred to as the AI singularity.

5. Dataset Cluster Analysis for Ad Conversions Data

5.1 About Sales Conversion Optimization:

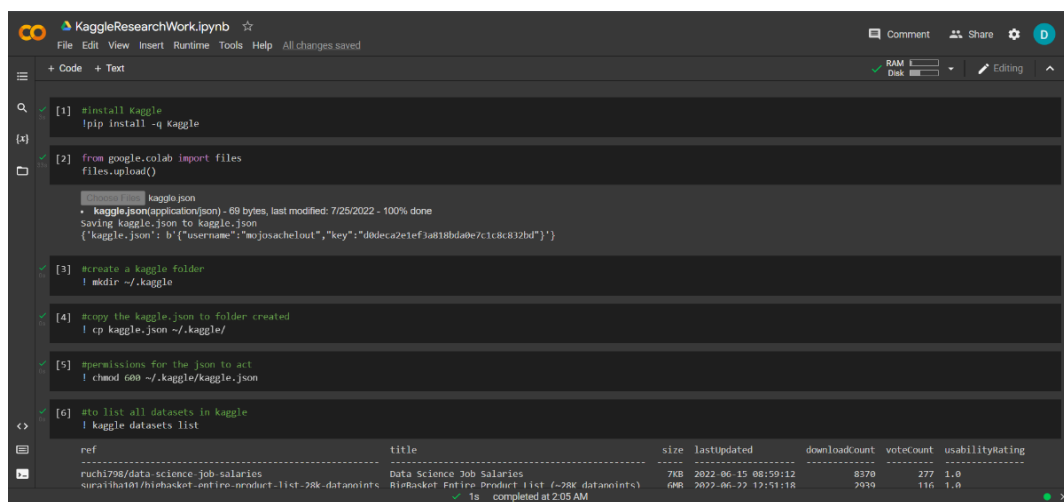Context - Cluster Analysis for Ad Conversions Data

5.2 Content

The data used in this project is from an anonymous organization's social media ad campaign. The file contains 1143 observations in 11 variables. Below are the descriptions of the variables.

1. ad_id: a unique ID for each ad.
2. xyzcampaignid: an ID associated with each ad campaign of XYZ company.
3. fbcampaignid: an ID associated with how Facebook tracks each campaign.
4. age: age of the person to whom the ad is shown.
5. gender: gender of the person to whom the add is shown
6. interest: a code specifying the category to which the person's interest belongs (interests are as mentioned in the person's Facebook public profile).
7. Impressions: the number of times the ad was shown.

8. Clicks: number of clicks on for that ad.

9. Spent: Amount paid by company xyz to Facebook, to show that ad.

10. Total conversion: Total number of people who enquired about the product after seeing the ad.

11. Approved conversion: Total number of people who bought the product after seeing the ad.

5.3 Dataset Extraction from Kaggle using Google Colaboratory,

Figure 4 : Jupyter Notebook Installation

Figure 5 : Dataset Extraction from Kaggle

5.4 Visualization:

Figure 8:

Interest Data :
Displays the most
popular interest
categories, revealing
key targets for
dynamic AI
marketing strategies.

Figure 9:

Impressions Data :
Represents ad
visibility, showing
how often ads
were viewed by
potential
customers.

Figure 12:

Total Conversion
Data :
Shows the overall
number of
conversions,
measuring the
effectiveness of the
AI-powered
campaigns.

Figure 13:

Approved
Conversion Data
Displays validated
conversions,
providing key
insights into
successful
campaign
outcomes.

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Figure 10:

Clicks :
Illustrates user
engagement by
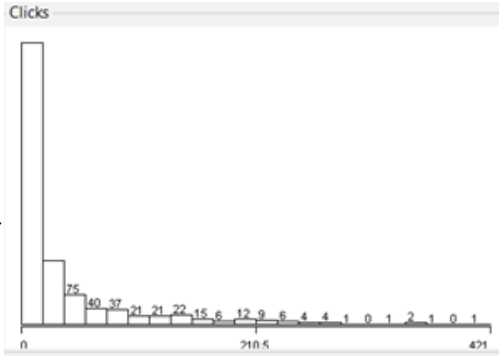showing the
total number of
clicks on ads.

Figure 11:

Spent :
Tracks
spending,
helping to
evaluate the
cost-
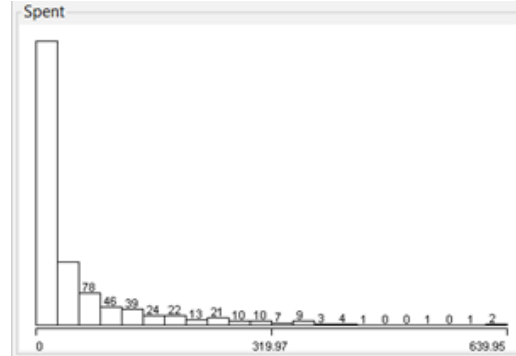effectiveness of
the marketing
campaigns.

Figure 4:

Age Data :
Shows the age
distribution,
providing
insights into the
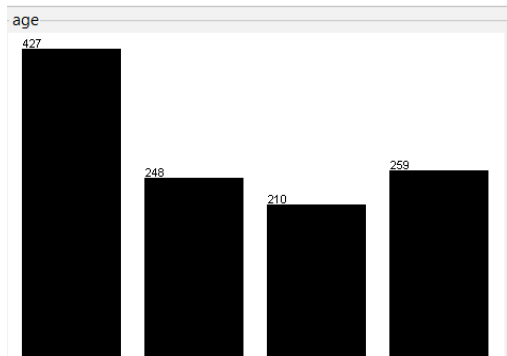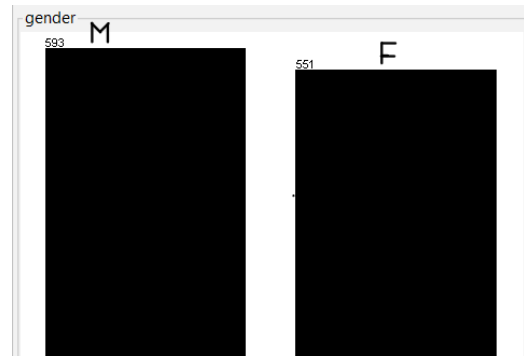most responsive
age groups for
campaigns.

Figure 7:

Gender Data:
Highlights the
gender
breakdown of the
audience, useful
for targeting
dynamic AI-
driven ads.

5. Artificial Intelligence models for a sustaining social media functioning,

1. **CANVA: (Content Management and scheduling)**

Creating **[13]** Social Media Graphics in Canva and sharing it to social media platforms.

a. Open Canva - Start by searching for "Social Media Graphics" in Canva.

b. Choose a template - Themes and industries covered include travel, commerce, quotations, celebrations, holidays, parties, and more. Find the right image for social media networks like Twitter, Facebook, and Instagram. To claim your favourite, just click on it.

c. Explore features & Customize - Canva has a huge collection of professionally produced graphics, photographs, drawings, icons, speech bubbles, shapes, and other components that you can use in your designs. Create motion using the animate function and use photo effects to apply filters.

d. Save and share - Your creations may be saved as JPGs, PNGs, or GIFs. You may use the "Share" feature in Canva to post straight to your social network profiles.

There is a great deal of transformation and loading happening in the Amazon Data Pipelines, which CANVA utilizes for data pipelining. [13] All the data processing is done using Apache Spark and its machine learning components. [13] Their recent research has focused on Deep Learning systems. There is a lot of ground to cover and low hanging fruit to pick when it comes to machine learning at Canva, therefore the potential effect on the company's user base is significant. You will be able to design and construct a lot of things, rather than merely maintaining current systems. You may find it difficult at first, but you will get a wealth of knowledge from it in the end.

2. **Lately: (Caption & Insights Management)**

With the help of artificial intelligence (A.I.), Lately creates hundreds of social media posts that include the terms that will get you the most attention. [14] Main features of Lately includes Dashboard of AI social media tools wherein you can generate multiple tweets at once related to URL, documents, or information. [14]. It can also Schedule social media posts as well as analyse metrics across channels

a. Your social media audience is studied to see what they prefer to watch, hear, or read. Then Lately's artificial intelligence creates your own bespoke writing model.

b. Based on that writing model, it then leverages that knowledge to create DOZENS of pre-tested social media posts based on any longform video, audio

or text that it has learned.

   c.   Instead of making educated guesses about which messages will be remembered in a void, Lately's A.I. analyses the digital interaction breadcrumbs left behind to determine which new messages are most likely to be recognized.

2.   Social bakers: (Social Media Insights for business strategies)

AI-Vision image recognition technology from Socialbakers. [15] Using algorithms supplied with both structured and unstructured data, Socialbakers AI is able to design a system that is both nimble and industry-leading. [15] Social bakers are now acquired by Emplifi.

   a.   Image Recognition- In its simplest form, artificial intelligence (AI) image recognition is a collection of algorithms that can recognize patterns in photos at the pixel level. [15] As it becomes better at recognizing patterns, it will be able to get increasingly better at seeing them. The AI must be trained on billions of pictures to learn all the potential aspects of any image, photo, or video material. Instant recognition of items in millions of photos is the ultimate goal.

   b.   Logo Recognition - When it comes to analyzing the success of sponsorship arrangements, AI logo recognition in photographs has huge ramifications for brand marketers. This has enormous ramifications, particularly for the marketing industry.

We found that AI has a lot of potentials when it comes to social media. [14] We looked at different ways it can be used to improve content design, management, and scheduling, and found that it can be a huge help in these areas. We concluded that AI potential in social media is wholesome. AI can be an excellent tool for content moderation, cross-site reposting and rankings, and content creation and much more. Conclusion were drawn from the research of tools among which few are listed above.

6. Conclusion and Future Scope

When it comes to achieving the best consumer experience, customization and artificial intelligence-based technologies have revolutionized the marketing landscape. It was in the latter part of the 2000s that machine learning algorithms found a new home in the marketing stacks. More and more businesses began to regard AI as not just the primary decision maker but also an important supplement to the decision-making process, gaining more and more confidence from marketers. This has changed in the last several years. Previously, marketers were wary of using artificial intelligence. [9] Amazon and Spotify have both used AI systems to

great effect in their marketing, but it is only recently that other well-known firms have followed suit. This new generation of smart algorithms is making an enormous impact, but marketers must be aware of their usefulness. In the future, marketers may anticipate a mixed strategy with more investments in algorithms that provide results while still giving them control. Our studies in Artificial Intelligence models for a sustaining social media functioning consisted of all-in-one required tools for AI effective deployment in digital market. [14] We found that AI has a lot of potentials when it comes to social media. [13] We also looked into few artificial intelligences all in one effective tool already available online for improvement in content design, management, and scheduling as well as cost optimization. Artificial intelligence systems may learn about human behavior and wants from their social media activities as the technology advances. It will also provide a new avenue for marketing in a more tailored manner. Artificial intelligence began providing customer service not long after this first phase was completed. In the future, customer service will be more individualized and engaging. In addition to answering client questions and providing product and service information, customer care technologies like chatbots may also be used to drive sales. Searching for products and receiving product recommendations was a critical area that was enhanced by the use of AI. A surge in the usage of voice search is being driven by advances in artificial intelligence (AI). [17] Augmented reality has become a popular tool for many businesses in an attempt to provide a better shopping experience for its customers. We can now make greater use of the data we gather and develop plans based on it thanks to AI technology's fast advancement.

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