To Achieve Business Growth and Development, Machine learning should be used for Digital Marketing rather than Traditional Methods.

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TABLE OF CONTENTS

1. INTRODUCTION

In today's world of technology, companies both large and small are shifting towards data science and Machine Learning tools and platforms. Machine Learning is a technology that tries to replicate human intelligence on machines. It has brought significant transition, and for humans (Bai, 2022).

Businesses have been storing data in various formats and the amount of data stored increases day by day. With the growth in the analytics sector, to stay ahead in the race and to stay relevant to the audience, companies must make use of the data not just to drive decisions, but to drive the business itself. This data can be more effectively used with various data science and machine learning tools and platforms (Douetteau, 2020).

Most of the businesses are competing to stay ahead in the modern technology development race, specially to have a digital dominance. This is a social media era and having one's presence on the same is important. Social Media is most beneficial channel for businesses, firms as well as users and consumers and for effective marketing (Arasu et al., 2020). With the increase in the use of social media, every day more than 6.5 billion images are shared on these platforms. Marketers and inclined towards images that consist of brand attributes. It is important to find right audience for the right content as content drives business growth (Hartmann et al., 2021).

When it comes to Businesses, both input and output are of immense importance as they can exploit the machine learning capabilities. Social Media Platforms have boomed drastically and with this the options for customers have also increased. Machine learning can assist marketers in providing the right product to the right customer (Ullal et al., 2021).

There are few issues that pull Marketers behind from exploring the technologies like Machine Learning, Artificial Intelligence and Data Analysis. There are few obstacles that comes into picture when developing the technologies. Especially when it comes to marketing, the author finds that the true potential of Artificial Intelligence and Machine Learning has not been explored. These technologies can go beyond customer segmentation, decision making process or customization (Volkmar et al., 2022).

However, there are real life case studies which proves that Machine Learning for Marketing has done nothing but improve the performance of business, firm, organization in terms of overall business growth and development especially in helping out with precise decision making. This is the reason Machine Learning should be used for Digital Marketing rather than Traditional Methods to Achieve Business Growth and Development.

Technology has boosted the growth of Digital Marketing sector. Technology named Artificial Intelligence has major influence in the marketing sector and will keep creating its impact in the future as well. Machine Learning technology helps simplify decision making as it can process massive data and forecast outcomes which eventually helps in better and precise decision making. Following that, technologies like Intelligent Robotics are exemplary for the digital marketing or internet marketing sector (Sarath et al., 2022).

2. LITERATURE REVIEW

Machine Learning is nowadays used by many growing businesses to improve their growth and further development. However, more exploration is required in the digital marketing is required since the true potential of the technology for marketing has not been yet explored. This is due to various limitations that comes with the technology also discussed in the paper further (Volkmar et al., 2022).

Several case studies have proved that the technology helped businesses performance improve. Hence despite the limitations, Machine Learning should be used for digital marketing rather than traditional methods.

Communication is a key when it comes to presence of a brand on any public platform. The implications of the communication from brand to viewers is of utmost importance. Machine learning algorithms can be deployed to get the relevant and most effective content for the right user as relevancy plays an important role (Taecharungroj, 2016).

Video content is the next big thing and is unstructured which leads to difficulty in interpretation and eventually extracting information. Due to difficulty in extracting meaningful information from unstructured data like video, analysis has been extremely limited. Video Analytics is an especially useful and interesting application for Machine Learning in Marketing (Li, 2019).

Another important aspect of Digital Marketing is finding right audience for advertising and eventually drive business goal. When compared the audience from the framework which uses Machine Learning to the audience manually selected, significant improvement in the performance can be observed for the framework audience (Zhang et al., 2016).

Identifying relevancy between customer and content and determining its impact on customer behavior is essential. The content showcased also represents the reputation of a brand and decides how observers revert to it. It is important to find the right audience for the right content and how content eventually drives the growth of the brand (Hartmann, 2021).

Research, which is based on real life databases, models, platforms, statistical theories was carried out for a E-commerce organization. The result of the same showed that E-commerce businesses can maintain a more stable relation with the customers which is mainly with the help of database marketing that utilized Machine Learning (Chen, 2022).

Customer Churn Prediction is something most of the business are looking to work on. If the distance factor has been taken into consideration to do the same, certainty of decision making can be predicted. With a few minor changes, this technique can be used to identify significant nodes in social media (Amin et al., 2019).

SOR Theory i.e., Stimulus Organism Response is a tried and tested strategy. More than 16,000 Business to Consumer posts were analyzed which concluded that every act of user response has different meaning for different posts and social media communication (Dai & Wang, 2021).

Network Analysis was carried out to identify target audience for online advertisement of a brand. For this large-scale data based on past consumer behavior will be needed as selecting the right is especially important and this can be done because the overlapping interest is usually the basic medium for audience selection. When compared the audience from the framework versus the audience manually selected, performance was better for framework audience (Zhang, 2016).

Random Forest Algorithm of Machine Learning used for the construction of Marketing System is comparatively more feasible and accurate strategy. Not having a reasonable strategy plan and struggling in achieving desired results can lead to a significant monetary loss (Wang & Wang, 2022).

3. TECHNICAL DETAILS

Machine Learning is a technology that tries replicate human intelligence on machines. It has brought significant transition, and for humans, it is undoubtedly the finest way to familiarize themselves with the world (Bai, 2022). Social Media Analysis is the capacity to acquire and interpret data from social media channels to support business choices and evaluate the effectiveness of activities taken because of those decisions (Arasu, 2020). Amalgamation of these two entities – Machine Learning and Social Media Analysis i.e., using Machine Learning to conduct Social Media Analysis can help businesses for its growth and development. Below are methods, technologies, algorithms, tools that will lead towards achieving the goal.

WEKA (Waikato Environment for Knowledge Analysis) is a machine learning tool for the prediction of behavior of the customer. This behavior tells things like the purchase intention of the customer. Better results are showed with WEKA when compared to other data mining methodologies (Arasu, 2020).

SOR Theory i.e., Stimulus Organism Response theory helps understand the relation between social media posts, its features, and attributes with user behavior (Dai & Wang, 2021).

Network Analysis helps to identify target audience for online advertisement of a brand. It works on large-scale data based on past consumer behavior will be needed. A network analysis is done over this skeleton, which evaluates its importance in selecting the right audience for brands as the overlapping interest is usually the basic medium for audience selection (Zhang, 2016).

Database marketing is important as there is so much information overload because of the increase in the number of platforms and devices. This overall helps provide accurate decisions (Chen, 2022).

Random Forest Algorithm is a Decision Tree based Machine Learning model. In this, there are multiple decisions trees who vote together, and the decision made by majority tree is the result. It is emphasized because it gives comparatively good regression prediction (Wang & Wang, 2022).

Customer Churn Prediction using Distance. The percentage of customers who stopped using a firms/ organization’s product or service over a specific period of time is known as customer churn. (Amin et al., 2019).

Image Recognition to improve brand image or perception. In the domain of machine vision, image recognition is the capacity of software to recognize items, locations, people, writing, and actions in images (Hartmann, 2021).

Video Mining is the process of identifying facts, patterns, structures, and noteworthy events in video data is called Video mining. Video falls unstructured data category which is very complex which leads to difficulty in interpretation and eventually extracting information. Video Analytics is an especially useful and interesting application for Machine Learning in Marketing (Li, 2019).

KNIME analytics is an easy to understand, all-in-one platform as it integrates marketing analytics tools and all this further makes the collaboration easier and less challenging. This is required because machine learning has numerous tools and platforms and integration of those at one place isn't there (Villarroel, 2021).

4. RISK LIMITATIONS AND STRATEGIES

4.1 Risks

The riskier a decision regarding ethical and moral values becomes, the more people will defer to AI and delegate decision-making authority to AI. This has a strong ethical component to it. In between Decision Making and Ethics, Role of Humans is of utmost importance. The fact that experts are dubious about eliminating human bias in AI and ML shows how important it is for psychologists, AI technology specialists, and data scientists to work together to address this complex issue (Volkmar, 2022).

According to research, humans tend to reject algorithms and AI, especially when mistakes occur, or humans feel less responsible. Only in certain situations, such as objective or numerical tasks, do humans prefer algorithmic advice over human judgment. As a result, despite their potential, many marketing executives are still skeptical of fully utilizing AI and ML in decision-making. Because machines do not explain their decisions, some marketing executives have difficulty trusting AI and ML recommendations. Computers may perform admirably, but for the wrong reasons (Volkmar, 2022).

In a marketing context, managers' extensive and disproportional use of AI, ML, and big data can create tensions between AI and subordinate managers. Finally, such reactions to AI and ML may raise concerns about robotic job replacement (Volkmar, 2022).

4.2 Limitations

Foundations states that Machine Learning is a technology that tries replicate human intelligence on machines. It has brought significant transition, and for humans, it is undoubtedly the finest way to familiarize themselves with the world. But its output is much different than that if humans. When it comes to Transparency and interpretability, it is very closely related to understandability. It finds difficulty in how humans and machines can communicate and understand each other. Machine learning cannot replace social, relational aspects. There is an

illusion that the world is going in a way like the knowledge acquired, so do the models if they are created with the same knowledge. Machines have exceeded their existing mental capacity volume compared to humans. Artificial Neural Networks is much ahead than humans when it comes to memory and recognition. But still nowhere close to humans in reasoning and imagination (Bai, 2022).

Especially when it comes to marketing, the true potential of Artificial Intelligence and Machine Learning has not been explored. These technologies can go beyond customer segmentation, decision making process or customization. Firstly, it is because of the traditional marketing taboo among the minds of Marketeers. Secondly topics related to decision-making and ethics comes into picture as major limitation due to the various ethical issues which vary from person to person and is a debatable topic (Volkmar, 2022).

There is a research gap in the literature on how machine learning affects different types of marketing. It is critical to comprehend how machine learning affects the digital marketing landscape (Ullal, 2021).

The introduction of AI tools into digital marketing strategy is required to transform data flow into valuable customer insights and to streamline marketing processes with significant breakthrough in business growth. There are limitations within the tools itself. RAPID MINER needs proficient knowledge of database management, ORANGE has large size and very less reporting attributes, KNIME doesn't provide efficient error measurement, R is not specialized for data mining (Arasu, 2020).

Machine Learning uses several types of data types, tools, and programming languages. All of this hinders the integration of marketing analytics which further makes the collaboration challenging (Villarroel, 2021).

4.3 Strategies

One of the strategies to improve customer engagement behavior towards social media posts and features in order to deliver high performance is using SOR Theory i.e., Stimulus Organism Response. This is a tried and tested strategy. To do this, more than 16,000 Business to Consumer posts were analyzed which concluded that every act of user response has different meaning for different posts and social media communication (Dai & Wang, 2021).

Another strategy is to conduct Network Analysis to identify target audience for online advertisement of a brand. For this large-scale data based on past consumer behavior will be needed. There are various ways brand can use to increase its engagement on Social Media platforms. A network analysis is done over this skeleton, which evaluates its importance in selecting the right audience for brands as the overlapping interest is usually the basic medium for audience selection. When compared the audience from the framework versus the audience manually selected, significant improvement in the performance was observed for the framework audience (Zhang, 2016).

With the help of data, relationship between the businesses and customers can be significantly improved, especially for the E-commerce sector. Research based on real databases, models, platforms, statistical theories shows that a more stable relation can be maintained with the customers with the help of database marketing that uses Machine Learning algorithm as it provides more accurate decisions and development strategies (Chen, 2022).

Deploying Random Forest Algorithm of Machine Learning for the construction of Marketing System is comparatively more feasible and accurate strategy. Random Forest Algorithm should be emphasized because it gives comparatively good regression prediction. Not having a reasonable strategy plan and struggling in achieving desired results can lead to a significant monetary loss. A strategy created along with the help of machine learning will not only help one reduce the loss, but also further lead the firm towards its growth and development (Wang & Wang, 2022).

Churn is an incredibly challenging issue, and every industry must tackle it. And prediction customer churn is even more challenging. This is mainly because both churn and non-churn customers have similar characteristics. If the distance factor has been taken into consideration to do the same, certainty of decision making can be predicted. Research proves advantages of utilizing the distance factor and creation zones for data to predict customer churn. With a few small adjustments, this technique can be used to identify significant nodes in social media (Amin et al., 2019).

Identifying relevancy between customer and content and determining its impact on customer behavior is essential. Marketers and inclined towards images that consist of brand attributes (logo, image) as content contributes to the lower funnel metrics. A higher click through rate (CTR) means content is relevant to the audience. This content also represents the reputation of a brand and decides how observers revert to it. It is important to find the right audience for the right content and how content eventually drives the growth of the brand. Image Recognition tools will play a significant role over here (Hartmann, 2021).

Video falls unstructured data category which is very complex which leads to difficulty in interpretation and eventually extracting information. After static, video or moving content is the next massive thing and content marketing is moving towards visual side. 80 percentage of average firms stored data is unstructured of which text, audio, video is a part of. This unstructured data plays a vital role in decision making. Due to difficulty in extracting meaningful information from unstructured data, analysis has been extremely limited. Video Analytics is an especially useful and interesting application for Machine Learning in Marketing (Li, 2019).

KNIME analytics in simple words is an easy to understand, all-in-one platform. To use KNIME, one shall have prior knowledge of Machine Learning and Data Analytics because they are of significant importance to the field of Marketing. A top visual programming tool with a feature where ML programs for Marketing can be implemented. Learning, sharing as well as reusing the code becomes possible. KNIME analytics is an all in one solution mainly because it is integrated with the tools in prior (Villarroel, 2021).

5. IMPLICATIONS FOR SOCIETY AND INDUSTRY

Machine Learning can be efficiently used for digital marketing right from connecting people to group of people to selling (Ullal, 2021). It is related to various social, relational aspects of society.

Machine learning aims to imitate human intelligence on machines, but its results are very different from what people would produce. Social and relational characteristics cannot be replaced by machine learning. When compared to humans, machines have more mental capacity than they have. Humans are far behind artificial neural networks in terms of memory and recognition. However, in terms of reasoning and creativity, they remain far below humans (Bai, 2022).

When it comes to businesses and firms, the managers seem to appear to be less tolerant of AI and ML failure and given that this is probably due to defensive decision-making rather than irrational expectations, so research could examine whether giving managers more autonomy or allowing them to make poor decisions lowers the prevalence of a Blame-AI culture and increases tolerance for AI and ML failure (Volkmar, 2022).

6. SUGGESTED COURSE OF ACTION

Artificial Intelligence has major influence in the marketing sector and will keep creating its impact in the future as well. Machine Learning bases analytical tools are examined with regards to digital marketing as there is influence of Machine Learning and the way it helps simplify decision making as it can process massive data and forecast outcomes which help in decision making. Following that, technologies like Intelligent robotics are exemplary for the digital marketing or internet marketing sector. With the help of these technologies one can determine customer requirements, personalize deals and offers for customers, create relevant content, store massive amounts of data to further use for business growth and development. Machine Learning helps businesses improve decision making by making appropriate predictions with the help of consumer data of various platforms and devices which are related to the business (Sarath, 2022).

Further study is required to examine how humans and AI interact in crucial areas like decision-making: Should AI have a low or high agentic role, and what might be relevant contextual factors (Volkmar, 2022).

Research should increase awareness of and reveal conflicts between internal and external goals as well as look into ways to use AI and ML to jointly achieve superior operational excellence and customer experience (Volkmar, 2022).

Foundation, Transparency, and interpretability are limitations of machine knowledge and requires future analysis to overcome it (Bai, 2022).

Machine Learning has various tools and platforms, integration of which under one roof/ one platform is necessary.

7. CONCLUSION

When it comes to Digital Marketing and Marketeers, there are a few issues that keep marketers from experimenting with technologies such as Machine Learning, Artificial Intelligence, and Data Analysis. When developing technologies, there are few obstacles to consider. The author believes that the true potential of Artificial Intelligence and Machine Learning has yet to be realized, particularly in marketing. These technologies have the potential to go beyond customer segmentation, decision making, and customization.

Technology has accelerated the growth of the Digital Marketing industry and will continue to do so. Artificial intelligence has had a significant impact on the marketing sector. Machine Learning technology aids in decision making by processing large amounts of data and forecasting outcomes, resulting in better and more precise decisions. Following that, technologies such as Intelligent Robotics are excellent examples for the digital marketing or internet marketing sector.

There are various real-life case studies discussed in the paper that demonstrated how Machine Learning for Marketing has improved the performance of businesses, firms, and organizations in terms of overall business growth and development, particularly in assisting with precise decision making. This is why, rather than using traditional methods to achieve business growth and development, Machine Learning should be used for digital marketing.

8. ANNOTATED BIBLIOGRAPHY

Amin, A., Al-Obeidat, F., Shah, B., Adnan, A., Loo, J., & Anwar, S. (2019). Customer churn prediction in telecommunication industry using data certainty. *Journal of Business Research*, *94*, 290–301.

Churn is an important issue that has be addressed in every business and its prediction is difficult. This is mainly because both churn and non-churn customers have similar characteristics. The study introduces an approach that will help firms tackle the issue. While taking into account, the distance factor also plays a key role. It showcases the pros and advantages of utilizing the distance factor and creation zones for data to predict customer churn. With a few small adjustments, this technique can be used to acknowledge significant branches or attributes in social media. This study has overall introduced a method for predicting customer churn and highlighted the effects of method which is related to distance within zones to predict the certainty of decision.

Arasu, B. S., Seelan, B. J., & Thamaraiselvan, N. (2020). A machine learning-based approach to enhancing social media marketing. *Computers and Electrical Engineering*, *86*.

The study explains concepts of Social Media Marketing and Machine Learning. Social Media is most beneficial channel for businesses, firms as well as users and consumers and for effective marketing, it also utilizes an open-source tool named WEKA (Waikato Environment for Knowledge Analysis) which is a machine learning tool for the prediction of behavior of the customer. This behavior tells us things like the purchase intention of the customer. Study further consists of results which showed better results

with WEKA when compared to other data mining methodologies. The journal has been concluded with few limitations and how the use of this tool can be further advanced.

Bai, H. (2022). The epistemology of machine learning. *Filosofija. Sociologija*, *33*(1).

This paper discusses the epistemology of machine learning which is divided into three parts - Foundation, Transparency, and interpretability as obstacles, three justifications for machine knowledge. Foundations states that Machine Learning is a technology that tries replicate human intelligence on machines. It has brought significant transition, and for humans, it is undoubtedly the finest way to familiarize themselves with the world. But Author states that its output is much different than that if humans. When it comes to Transparency and interpretability, it is very closely related to understandability. It discusses how humans and machines can communicate and understand each other. Formal Justification talks about how machine learning cannot replace social, relational aspects. Model Justification explains the illusion that the world is going in a way like the knowledge acquired, so do the models if they are created with the same knowledge. Machines have exceeded their existing mental capacity volume compared to humans. Practical Justification is Machine Learning that is based on Artificial Neural Networks is much ahead than humans when it comes to memory and recognition. But still nowhere close to humans in reasoning and imagination.

Chen, N. (2022). Research on E-commerce database marketing based on machine learning algorithm. *Computational Intelligence and Neuroscience*, 1–13.

This research concerns businesses in the E-commerce sector and how the relation between businesses and customers can be improved with the help of data collected. The study is around database marketing and how important it is, especially when there is so much information overload as the number of platforms and devices has increased. It states that compared to traditional marketing, a more stable relation can be maintained with the customers with the help of database marketing that uses Machine Learning algorithm as it provides more accurate decisions and development strategies. Further the study proposes strategies for online stores and encourages the advancement of machine learning algorithms on a practical level. All of this is supported by real databases, models, platforms, and various statistical theories.

Dai, Y., & Wang, T. (2021). Prediction of customer engagement behaviour response to marketing posts based on machine learning. *Connection Science*, *33*(4), 891–910.

The research in the journal focuses on customer engagement behavior towards social media posts and features and its prediction to deliver high performance. This contribution (social platforms and customer response) has been made in three parts. The author started with the use of SOR Theory i.e., Stimulus Organism Response to understand how the social media post and its features relate to the user behavior. To do this, more than 16,000 B2C posts were analyzed which concluded that every act of user response has different meaning for different posts and social media communication. Secondly there was a follow-up done where the relation between posts and response was decoded. Lastly, three

experiments were conducted to understand the effectiveness of Machine Learning in both human designed and machine-made features to get proper predictions.

Douetteau, F. (2020). *Why Enterprises Need Data Science, Machine Learning, and AI platforms*. Dataiku. Retrieved from https://pages.dataiku.com/hubfs/PDF/Whitepaper/why-enterprises-need-DS-ML-AI-Platforms.pdf

This paper talks about reasons for companies both large and small shifting towards data science and Machine Learning tools or platforms followed by why the use of these tools and platform is important. The author says that the amount of data increases day by day and the businesses have been storing this data which is in different formats and coming from different devices even more than before. With the growth in the analytics sector, to stay ahead in the race and be relevant companies must make use of the data not just to drive decisions, but the business itself. Most of the businesses are competing to do that. This data can be more effectively used with various data science and machine learning tools and platforms.

Hartmann, J., Heitmann, M., Schamp, C., & Netzer, O. (2021). The power of Brand Selfies. *Journal of Marketing Research*, *58*(6), 1159–1177.

This research hovers around the content on social media, identifying relevancy between customer and content, and determining its impact on customer behavior. The content discussed within the study refers to selfies whose popularity has been humungous. This content is all matter of one's perspective. Marketers and inclined towards images that consist of brand attributes (logo, image) as content contributes to the lower funnel metrics. A higher click through rate (CTR) means content is relevant to the audience. This content also represents the reputation of a brand and decides how observers revert to it. The author concluded by saying there exists a strong relation between the brand's image or reputation and brand selfie which is the content. Because content is what drives the lower funnel which drives upper funnel and eventually the growth of the brand.

Li, X., Shi, M., & Wang, X. (S. (2019). Video mining: Measuring visual information using automatic methods. *International Journal of Research in Marketing*, *36*(2), 216–231.

The study is about video mining and how information can be extracted from this form of unstructured data. The premise is around the fact that unstructured data is very complex which leads to difficulty in interpretation and eventually extracting information. After static, video or moving content is the next massive thing and content marketing is moving towards visual side. According to author, 80 percentage of firms stored data is unstructured of which text, audio, video is a part of. This unstructured data plays a vital role in decision making. Due to difficulty in extracting meaningful information from unstructured data, analysis has been extremely limited. The study gives insights and techniques on how data and information can be extracted from unstructured data.

Sarath Kumar Boddu, R., Santoki, A. A., Khurana, S., Vitthal Koli, P., Rai, R., & Agrawal, A. (2022). An analysis to understand the role of machine learning, Robotics and Artificial Intelligence in digital marketing. *Materials Today: Proceedings*, *56*, 2288–2292.

In the research the focus is around Artificial Intelligence, Machine Learning and Robotics sector in Digital Marketing. The research reveals that Artificial Intelligence has major influence in the marketing sector and will keep creating its impact in the future as well. Machine Learning bases analytical tools are examined with regards to digital marketing. This is done by looking at the influence of Machine Learning and the way it helps simplify decision making as it can process massive data and forecast outcomes which help in decision making. Following that, technologies like Intelligent robotics are exemplary for the digital marketing or internet marketing sector. With the help of these technologies one can determine customer requirements, personalize deals and offers for customers, create relevant content, store massive amounts of data to further use for business growth and development.

Taecharungroj, V. (2016). Starbucks' Marketing Communications Strategy on Twitter. *Journal of Marketing Communications*, *23*(6), 552–571.

This is a social media era and having one's presence on the same is important. The journal focuses on a well-known brand Starbucks communication strategy on twitter. The tweet, retweet, replies are first categorized and then evaluated to understand its effectives. To do this, the author has analyzed 565 tweets and almost 1392 replies. The categories of communications are divided into three types – Information, Emotion, Action. When analyzing the categories, the author concluded that brands should use diverse types of content, content should also use some visual entities and brands should be prepared to manage customer interaction over social media.

Ullal, M. S., Hawaldar, I. T., Soni, R., & Nadeem, M. (2021). The role of machine learning in Digital Marketing. *SSRN Electronic Journal*.

The research in detail explains the importance of Machine Learning in Digital Marketing Sector. When it comes to Businesses, both input and output are of immense importance as they can exploit the machine learning capabilities. Social Media Platforms have boomed drastically and with this the options for customers have also increased. Machine learning can assist marketers in providing the right product to the right customer. Facebook and Amazon have efficiently used machine learning for digital marketing right from connecting people to group of people to selling etc. and other businesses surely have much to learn from them. The author has further discussed the limitations and implications of the use of Machine Learning and has concluded with solutions.

Villarroel Ordenes, F., & Silipo, R. (2021). Machine learning for marketing on the Knime Hub: The development of a live repository for marketing applications. *Journal of Business Research*, *137*, 393–410.

The Journal mainly aims to explain KNIME Analytics and how it can be utilized for marketing. In order to use KNIME, one shall have prior knowledge of Machine Learning and Data Analytics because they are of significant importance to the field of Marketing. Machine Learning uses several types of data types, tools, and programming languages. All of this hinders the integration of marketing analytics which further makes the collaboration challenging. KNIME analytics in simple words is an easy to understand, all-in-one platform. A top visual programming tool with a feature where ML programs for Marketing can be implemented. Learning, sharing as well as reusing the code is possible. The research further showcases several experiments highlighting the various uses of Machine Learning in multiple areas.

Volkmar, G., Fischer, P. M., & Reinecke, S. (2022). Artificial Intelligence and machine learning: Exploring drivers, barriers, and future developments in Marketing Management. *Journal of Business Research, 149*, 599–614.

The Journal talks about Artificial Intelligence and Machine Learning. Author discusses How and why these technologies are not explored, obstacles in development and what can be done for future progress. Especially when it comes to marketing, the author finds that the true potential of Artificial Intelligence as well as Machine Learning has not been explored. These technologies can go beyond customer segmentation, decision making process or customization. The author has discussed all the ifs, buts, whys, and how in three categories. Firstly, author initiated the discussion which was around the culture, strategy, and implementation. Secondly it was followed by topics related to decision-making and ethics for discussion. And finally, customer management was thoroughly evaluated.

Wang, K., & Wang, N. (2022). Marketing system construction and risk analysis based on Random Forest of machine learning. *Wireless Communications and Mobile Computing, 2022*, 1–9.

In today's era, firms are lacking behind mainly because of lack of understanding of "marketing strategy" itself. Not having a reasonable strategy plan and struggling in achieving desired results can lead to a significant monetary loss. That is why this research is more or less around Random Forest Algorithm of Machine Learning and how it can be deployed for the construction of Marketing System. The research starts that emphasis is on Random Forest Algorithm mainly because it has comparatively good regression prediction. The paper compares pre and post optimization results and confirms models' feasibility and accuracy. This paper examines marketing models of businesses in terms of their characteristics and problems or setbacks within existing strategies and proposes solutions and gives out recommendations in order to achieve efficient growth and development.

Zhang, K., Bhattacharyya, S., & Ram, S. (2016). Large-scale network analysis for online social brand advertising. *MIS Quarterly, 40*(4), 849–868.

In order to identify target audiences for a brand's online advertising, the study within the journal proposes a skeleton for the use of large-scale data based on users' past behaviors. This data is based on users' activities on various brands platforms. This skeleton is a way brand can use to increase its engagement on Social Media sites. A network analysis was done over the skeleton, which evaluated its importance in selecting the right audience for brands product or service as the overlapping interest was basic medium for audience selection. When the author compared the audience from the framework versus the audience manually selected, significant improvement in the performance was observed for the framework audience.