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Artificial Intelligence (AI) competencies for rise the performance of digital marketing perspective

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***Abstract*---purpose:** This study aimed to identify the role of artificial intelligence (AI) in enhancing the performance of digital marketing in companies. **importance/Value:** AI, with its diverse types, characteristics, and applications, has become an essential tool for achieving corporate goals with greater efficiency. The importance of AI has emerged from its high usage rate in digital content, ease of use, effectiveness in digital marketing, and powerful predictive capabilities the integration of AI and digital marketing allows companies to precisely target specific customer segments, reducing wasted effort and advertising costs while achieving marketing goals more efficiently.

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Methodology/Approach: This study focus on telecommunication companies in Algeria (Ooredoo,Djeezy and Mobilse) As the most companies that apply e-marketing, its website witnesses great interaction, It needs continuous advertising campaigns due to the intense competition witnessed in the sector. **Findings:** The findings indicate a positive correlation between artificial intelligence and the effectiveness of digital marketing, demonstrated by increased sales rates, market share expansion, and enhanced ease in achieving marketing objectives. **Conclusion:** The study concluded that there is a positive relationship between AI and digital marketing. It recommends that the institutions studied should adopt AI to further improve e-marketing through continuous research and development. **Recommendations**: from the research results we emphasis the integrate the AI in most tasks in companies, especially the digital marketing.

***Keywords*---**Artificial Intelligence, Digital Marketing, machine learning, personalized advertising, marketing automation, natural language processing (NLP).

1. Introduction

Background of the Study

Artificial Intelligence, once a futuristic concept, has become an integral part of our daily lives. From personalized recommendations on e-commerce platforms to chatbots providing customer support, AI is revolutionizing various industries, including marketing. This study delves into the profound influence of AI on modern marketing practices, exploring its applications, benefits, and challenges.
AI, defined as the intelligence exhibited by machines, has significantly impacted marketing companies. By analyzing vast amounts of customer data, AI enables marketers to segment audiences, personalize campaigns, and optimize advertising efforts. This, in turn, leads to improved customer satisfaction, increased sales, and enhanced brand loyalty.

Problems Statement: To address the main research question, the study is structured around the following questions:

1. How does AI influence digital marketing in the commercial business landscape?
2. What are the differences between machine learning and deep learning?
3. What are the potential benefits of AI in marketing?
4. How can AI assist marketers in their strategies and tactics?
5. Are there real-world applications of AI in the business field?

Hypothese: To address the primary research question and its associated questions, the study proposes the following hypothese: AI can effectively enhance digital marketing strategies when applied correctly.

Research Objectives: This research aims to contribute to the understanding of the intersection between AI and marketing. By examining the applications, benefits, and challenges of AI in this field, this study can provide valuable insights for businesses seeking to leverage AI for competitive advantage and improved marketing outcomes.

Scope of the Study: This study will focus on how artificial intelligence (AI) contributes to ramping up the digital marketing strategies in telecom companies of Algeria such as Ooredoo, Djezzy, and Mobilis. The study will give answers to just how much AI- technology improves effectiveness, cost, and overall efficiency of the marketing buzz of the respective telecom industry. There are certain factors of examination applied to run the relevant study, including :

- **Customer engagement:** How AI leads to more clicks and creates a better-engaged customer relationship through personalized advertisements, user experience, and others.
- **Cost of marketing:** The amount of marketing expenses saved using better AI and allocating the resources to the right place will help in contrasting this dimension.
- **Marketing automation and personalization:** How fast marketing can be made and how easy it is to advertise with the help of AI through automating the routine job.
- **Technological adoption:** The use a technology like machine learning, natural language processing (NLP), predictive analysis, and others in marketing activities.
- **Market-telecommunications competition:** To what extent AI provides a competitive edge in the market features like Ooredoo, Djezzy, and Mobilis.
- **Global comparison and best practices:** This project will help to bring in the global ranking of AI used in digital marketing and best practices to be followed in Algerian practice.

Significance of the Study: The study holds vital importance for various parties. The parties are mostly stakeholders and include the findings of the capability of Artificial Intelligence (AI) to transform digital marketing and hence, increase the user reach more effectively and efficiently. The importance can be underlined as follows.

For the Companies :
- To illustrate how AI can lead to a more efficient marketing strategy.
- Allocate the resources better as per the company's criteria.
- Engage the user or the customer more effectively.
- For instance, Oreedoo, Djezzy, Mobilis

For the Industry :
- It will help to perform better.
- The marketing will be easier to a great extent.
- It is what will help the Industry companies keep up with the technological trend.

For the Policy and Decision-Makers:
To promote the whole structure, a great deal should be directed towards promoting policies and better infrastructure that will help grow that sector and also increase the AI adaption for an enhanced performance.

For the Academics: There has been a considerably fewer number of discussions in AI analysis for marketing strategies. This will significantly improve the AI adaption in other sectors in the region or other.

For the Customers: That will enjoy a more user-friendly and mainly tailored market.

II. Conceptual Framework

1. **Intelligence (AI) :** Artificial intelligence (AI) has emerged as one of the most exciting and influential fields in modern technology (Grandhi, 2021), with vast applications across numerous industries (Innovation, 2024). Its potential to revolutionize problem-solving and decision-making makes it an essential area of study globally (Almestarihi, 2024).

2. What is AI :

2.1. Intelligence

Intelligence refers to the ability to learn, solve problems, and achieve goals, adapting to an ever-changing, (Brunborg, Journal of Adolescenc) uncertain world. Unlike a pre-programmed robot, which is highly efficient but lacks the capacity to think, intelligence involves flexibility and adaptability (Manning, 2020).

2.2. Artificial Intelligence : AI refers to the simulation of human intelligence in machines (Carsten Lund Pedersen a, 2024). The concept dates back to the 1950s when Alan Turing introduced the Turing Test, which posed the question, "Can machines think?" (Turing, 1950). John McCarthy later coined the term “Artificial Intelligence” in 1955 during the Dartmouth Summer Research Project on AI (Haenlein, 2019). AI aims to create machines capable of behaviors that would be deemed intelligent if exhibited by humans (Alkhayyat & Ahmed, 2022, p. 9).

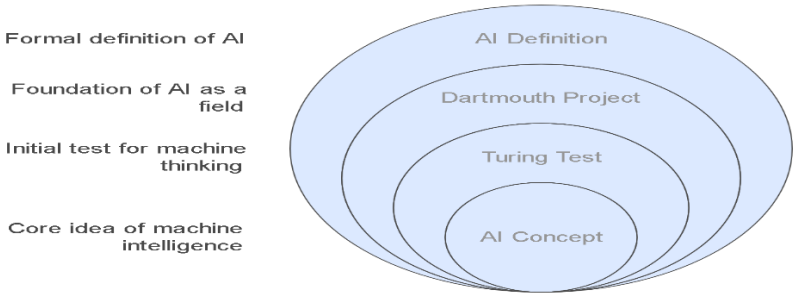

Fig 01: Evolution and components of Artificial Intelligence.

AI systems perform tasks typically requiring human intelligence, such as recognizing images or voices, making decisions, and interpreting language (Rakib & Rabbi, 2023, p. 11). In essence, AI enables computers to think, learn, and execute tasks independently.

3. Machine Learning: Machine learning (ML), a subset of AI, focuses on building algorithms that improve with experience and feedback (Haenlein, Artificial intelligence and robotics: Shaking up the business world and society at large, 2021). This field is constantly evolving and is divided into three types of learning (Carsten Lund Pedersen a, Digital authenticity: Towards a research agenda for the AI-driven fifth phase of digitalization in business-to-business marketing, 2024) :

3.1. Supervised Learning: Uses labeled data to train models that predict outcomes. For instance, in classification problems, the data is categorized and evaluated based on accuracy, measured by the true positive and false positive rates. A classifier, the result of this process, predicts labels for new data (Bartneck, 2021, p. 10).

3.2. Unsupervised Learning: Concentrates on identifying patterns within data without labels. Techniques like clustering and principal component analysis help explore data structure (Kaplan, 2022).

3.3. Reinforcement Learning: Involves learning policies based on rewards. The system takes actions that maximize long-term rewards. For example, a robot navigating toward a goal adjusts its movements based on feedback from its sensors (Bartneck, 2021, pp. 11-12).

3.4. Deep Learning: Deep learning, a branch of machine learning, models the way human brains process information by using neural networks. These networks require vast amounts of data and computational power. Deep learning allows systems to autonomously identify key features from data, minimizing the need for manual programming (Nadav Cohen ∗, 2024).

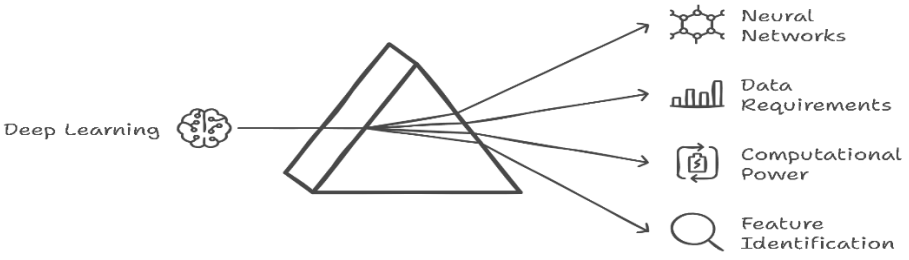

Fig 02 : Deep Learning : Convergence of Ideas

This approach has gained prominence in recent years due to advances in computing power (Varma, 2024). Deep learning models enhance machine learning by addressing complex problems like high-dimensional data, which were difficult to tackle with traditional techniques.

4. Types Of AI;

4.1. Artificial Narrow Intelligence (ANI) : also known as Narrow AI or Weak AI, is a type of Artificial Intelligence focused on one single narrow task. It possesses a narrow-range of abilities. This is the only AI in existence today (1, 2023), for now. Narrow AI is something most of us interact with on a daily basis. Think of Google Assistant, Google Translate, Siri,Cortana, or Alexa (A. Tealab, 2017).

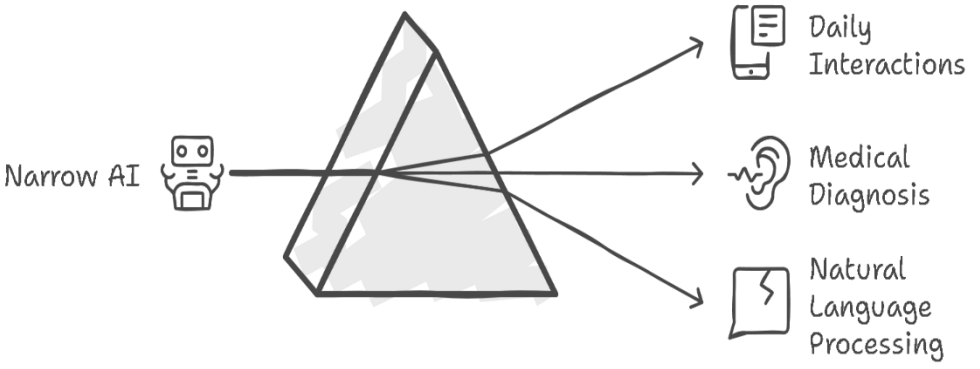

Fig 03 : Artificial Narrow Intelligence (ANI)

They are all machine intelligence that use Natural Language Processing (NLP) (D.W. Otter, 2020). NLP is used in chatbots and other similar applications (Lennart Ante a, 2025). By understanding speech and text in natural language they are programmed to interact with humans in a personalized, natural way. AI systems today are used in medicine to diagnose cancers and other illnesses with extreme accuracy by replicating human-like cognition and reasoning. (susan-fourtane, 2019, p. 2)

4.2. Artificial General Intelligence (AGI): When we talk about Artificial General Intelligence (AGI) we refer to a type of AI that is about as capable as a human (Global X, 2023). However, AGI is still an emerging field. Since the human brain is the model to creating General Intelligence (Liron Pantanowitz, 2024), it seems unlike that will happen relatively soon because there is lack of a comprehensive knowledge of the functionality of the human brain. Yet, as history has shown many times, humans are prone to creating technologies that become dangerous to human existence. Why then trying to create algorithms to replicate brain function would be different? When this happens, humans will have to accept the consequences this might bring. (susan-fourtane, 2019)

4.3. Artificial Super Intelligence (ASI) : is way into the future. Or, that is what we believe. To reach this point and to be called an ASI (Anne-Kathrin Kleine a, 2025), an AI will need to surpass humans at absolutely everything. The ASI type is achieved when AI is more capable than a human. This type of AI will be able to perform extraordinary well at things such as arts, decision making, and emotional relationships. These things are today part of what differentiates a machine from a human. In other words, things that are believed to be strictly

human. However, many could argue that humans have not yet mastered the art of emotional relationships, or good decision making. Does it mean that perhaps, a few centuries into the future, Artificial Super Intelligence will master areas where humans have failed? (susan-fourtane, 2019, pp. 3-4)

5. Applications of AI:

5.1. AI in Astronomy Artificial Intelligence can be very useful to solve complex universe problems. AI technology can be helpful for understanding the universe such as how it works, origin, etc. (Nguyen, 2022).
5.2. AI in Healthcare In the last, five to ten years, AI becoming more advantageous for the healthcare industry and going to have a significant impact on this industry. Healthcare Industries are applying AI to make a better and faster diagnosis than humans (Verhagen, 2014). AI can help doctors with diagnoses and can inform when patients are worsening so that medical help can reach to the patientbefore hospitalization (Aman Pathak *, 2024).
5.3. AI in Gaming AI can be used for gaming purpose. The AI machines can play strategic games like chess (Ai-Chu Elisha Ding a, 2024), where the machine needs to think of a large number of possible places.
5.4. AI in Finance AI and finance industries are the best matches for each other. The finance industry is implementing automation, Chabot, adaptive intelligence, algorithm trading, and machine learning into financial processes (Gerard LF, 2016).
5.5. AI in Data Security The security of data is crucial for every company and cyber-attacks are growing very rapidly in the digital world. AI can be used to make your data more safe and secure. Some examples such as AEG bot, AI2 Platform, are used to determine software bug and cyber-attacks in a better way (Alexandros Gazos a, 2025).
5.6. AI in Social Media Social Media sites such as Facebook, Twitter, and Snap chat contain billions of user profiles, which need to be stored and managed in a very efficient way. AI can organize and manage massive amounts of data. AI can analyse lots of data to identify the latest trends, hashtag, and requirement of different users (Schulman, 2007).
5.7. AI in Travel & Transport AI is becoming highly demanding for travel industries. AI is capable of doing various travel related (Campbell, 2020) works such as from making travel arrangement to suggesting the hotels, flights, and best routes tothe customers. Travel industries are using AI-powered chatbots which can make human-like interaction with customers for better and fast response.
5.8. AI in Automotive Industry Some Automotive industries are using AI to provide virtual assistant to their user for better performance. Such as Tesla has introduced TeslaBot, an intelligent virtual assistant. o Various Industries are currently working for developing self-driven cars which can make your journey more safe and secure (Vrontis, 2022).

II. Digital marketing :
Refers to the practice of promoting products and services through digital platforms like websites, mobile apps, (Grandhi B. , 2021)social media, and search engines. It combines traditional marketing concepts with modern technologies to enhance customer interaction and engagement, creating a two-way

communication between businesses and consumers (Wim Biemans a, 2024). While traditional advertising methods, such as radio and TV, are still relevant, digital marketing has become increasingly significant as more consumers shift to online platforms. The evolving field also highlights the growing role of artificial intelligence in shaping marketing strategies and research.

1. Marketing is : the oldest concept with the human beings of identifying, creating, exchanging need and relationships between seller and buyer in promoting and enabling the process of trading product or service (Mishra,2020). The marketing is that the broader thanks to reach customer which involves selling because the prime cause been influenced through different stepslike need understanding, brand recognition and thereby completing element of sales and purchase (Kotler, Armstrong & Agnihotri, 2018).

2. Types of Digital Marketing:

Fig 04 : The different types of Digital Marketing channels.

1. Search Engine Optimization (SEO): Search engine optimization (SEO) is a process to increase (Viererbl, 2022)the websites online visibility and build traffic to the website. SEO "involves achieving the highest position or ranking practical in the natural or organic listings on the search engine results pages after a specific combination of keywords (or key phrases) has been typed in" (Chaffey & Smith, 2017).

2. Social media marketing: "Social media marketing is a form of internet marketing (Caiyuan Ma a, 2025) that involves creating and sharing content on social media networks in order to achieve your marketing and branding goals" (WordStream 2018).

3. Email Marketing: Email marketing is marketing through email and a way to deliver targeted marketing messages to potential or existing customers. Email marketing is a marketing tactic that is commonly used as a prospect conversion and customer retention tool. The marketing emails are send to prospects and customers that have given permission and effective email campaigns require strategy for content and sending frequency. (American Marketing Association

2018; Chaffey & Smith 2017, 16 & 484.)

4. Display advertising: Paid advertising, also known as display advertising, consist of any type of paid- for ads, such as banner ads, Pay Per Click ads, search ads, promoted posts and promoted tweets. Display advertising is similar to conventional ads (Mochamad Nurhadi a, xxxxxxx). There are texts and images with a link to the organizations webpage and the visitor will see the advertisement after typing a specific search phrase to a search engine. (Chaffey & Smith 2017, 384)

5. Inbound marketing: the objective of inbound marketing is to create, distribute and promote right kind of content that attracts the right people at the right time. In order to success in inbound marketing the advertiser needs to create content that is relevant and helpful to their customers, attract them to the organizations website and convert the visitors as paying customers. Inbound is also a cost effective marketing method as the distribution channels are free. (Hawlk 2018)

6. Customer reference marketing: In customer reference marketing enterprise utilize existing or previous customer relationship as reference to attract new customers. With customer reference marketing an organization can affect to customer acquisition, reputation building and value creation potential by providing evidence on organizations ability to deliver estimated value. (Terho & Jalkala 2017, 2- 3 & 6.)

7. Mobile Advertising: Mobile marketing is rapidly growing marketing channel that offers a new way to approach customers. "Mobile marketing means using interactive wireless media to provide clients with personal information with precise profiling using geo- location, time, and often associated with their interests, sex or other attributes, promoting goods, services and ideas, thus, also generating added value for all the process participants" (Lukowski, 2018).

III- Data background and methodology

This section outlines the methodology and tools used to conduct the study, enabling other researchers to replicate or verify it.

1. Study Model and Variables :

1.1 Study Model : The study explores the role of artificial intelligence (AI) in digital marketing, using descriptive and analytical methods. It aims to describe the current reality and characteristics of AI applications and quantify their impact on digital marketing.

1.2 Study Variables :

- ✓ **Independent Variable:** AI applications.
- ✓ **Dependent Variable:** Digital marketing.

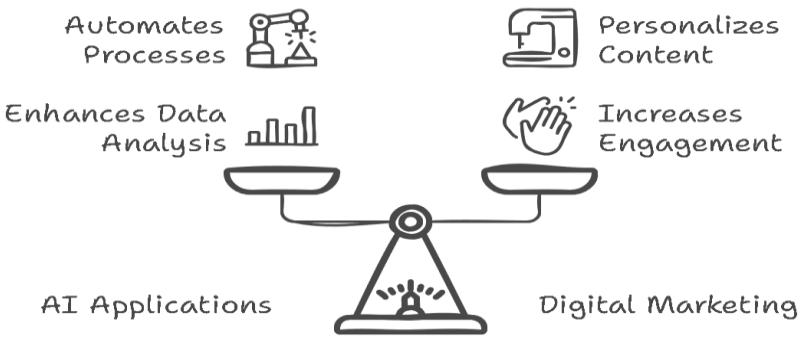

Fig 05 :AI 's role in transforming Digital marketing

2. Data collection process:

- **Study Population :** Includes all businesses and agencies in the market, though due to the difficulty of surveying every entity, a sample was selected (BPS, 2023).
- **Population and sample :** Consists of 37 employees from companies like Ooredoo, Mobilis, Algerie Telecom, Djezzy, Pubox, and Ebox Dz. The sample was chosen randomly to address the study's main question: how can AI enhance digital marketing?

3. Study Tools: To validate the research hypotheses, the following tools were used:

3.1 Observation: Multiple visits were made to companies to observe the use of AI in digital marketing.

3.2 Survey: A survey was conducted to gather data on the companies' use of AI in digital marketing.

4. Statistical Analysis Methods:

4.1.Descriptive Methods:

✓ Frequencies and percentages to describe sample characteristics.
✓ Arithmetic mean to identify trends in responses.
✓ Standard deviation to measure data dispersion.

4.2. Inferential Methods:

✓ **Cronbach's Alpha:** Used to validate the reliability of the study tools.
✓ **ANOVA:** To test differences in perceptions among sample members.
✓ **Pearson's Correlation Coefficient:** To measure the relationship between AI (independent variable) and digital marketing (dependent variable).

5. Statistical approach :

5.1. Distribution of the study sample according to the educational qualification variable

Table (1) Distribution of the study sample according to the years Qualifications level

Variable	Categories	Repitition	Percentage
qualifications	High school	4	10.8%
	Degree	14	37.8%
	Master	18	48.6%
	doctorat	1	2.7%
	total	37	100%

Source: Prepared by the authors based on SPSS outputs

The study sample is dominated by participants with a Master's degree (48.6%) and Degree holders (37.8%), showing a strong focus on highly educated individuals. High school graduates (10.8%) and Doctorate holders (2.7%) are underrepresented, making the findings more applicable to those with higher education. The skew towards postgraduate qualifications suggests the study's relevance may be limited to well-educated populations.

Table (2) Distribution of the study sample according to the years of experience variable

Variable	categories	repetition	percentage
Year of experience	Less than 10 years	28	76%
	From 11 to 15 ears	3	8 %
	More than 16 years	6	16%
	total	37	100%

Source: Prepared by the authors based on SPSS outputs

The study sample is dominated by individuals with less than 10 years of experience (76%), while only 8% have 11-15 years. Participants with over 16 years of experience form 16% of the group. This distribution highlights a skew towards less experienced professionals. Findings may therefore reflect the perspectives of early-career individuals more strongly than those of seasoned professionals.

Table (3): Shows data related to the Artificial intelligence variable

Number	Statments	Arithmetic average	standard deviation
1	Artificial intelligence is of great importance in your organization	3.0541	1.24601
2	Your organization is working hard to train your employees on artificial intelligence tools	2.8108	1.19810
3	Your organization's employees are aware of the importance of practicing artificial intelligence in marketing activities	2.9730	1.09256
4	You have a clear idea about artificial intelligence	4.1622	0.60155
5	Using artificial intelligence helps achieve and reach goals faster	4.5405	0.60528
6	AI enables machines to learn from data and improve over time	4.2703	0.60776
7	Artificial intelligence is transforming and revolutionizing	4.1622	0.76425

Source: Prepared by the authors based on SPSS outputs

This data examines the perception and adoption of Artificial Intelligence (AI) in an organization based on seven statements. Each statement is rated on a scale, yielding an arithmetic average, standard deviation, and degree of responsiveness (ranging from "middle" to "very high").

5.2. Moderate Perception of AI Importance:
Statement 1 shows a moderate recognition of AI's importance in the organization, with an average score of 3.05 and a standard deviation of 1.25.

5.3. Limited Training and Awareness:
Statements 2 and 3 indicate a moderate effort in AI training (average 2.81) and awareness of AI's role in marketing (average 2.97), both showing a standard deviation around 1.1, reflecting varying responses.

5.4. High Personal Understanding of AI:
Statement 4 shows that respondents have a high understanding of AI, with an average of 4.16 and a lower standard deviation (0.60), indicating consistent responses.

5.5. Strong Belief in AI's Efficiency and Learning Capabilities:
Statements 5 and 6 suggest a very strong belief that AI helps achieve goals faster (average 4.54) and enables machines to learn and improve (average 4.27), both with low standard deviations (~0.60), reflecting high agreement.

6. Transformative Nature of AI:

Statement 7 also scores high (4.16), indicating agreement that AI is transforming industries, though the higher standard deviation (0.76) shows some variation in opinion.

Table (4): Shows data related to the Artificial intelligence variable

Number	statements	Arithmetic average	Standard deviation
17	Artificial Intelligence is revolutionizing digital marketing by automating repetitive tasks and improving processes.	4.0811	0.79507
18	Natural language processing enables artificial intelligence toanalyze and interpret customer sentiment and feedback.	3.7568	0.95468
19	Automated content generationpowered by AI ensures consistent and relevant, messaging.	3.5946	0.83198
20	AI-based ad optimization maximizes ROI by targeting theright audience at the right time.	3.8108	0.84452
21	Artificial Intelligence serves as the foundation for innovative marketing strategies, driving competitive growth in the digital landscape	3.9459	0.88021
22	AI-driven personalized recommendations improve user experience and increase traffic	3.8919	0.87508
23	AI-powered chatbots provide instant customer support	3.8919	0.90627
24	AI-powered insights and strategies drive data-driven decision making for targeted campaigns	3.8108	0.61634
AI as a pillar of digital marketing		3.8479	0.83801

Source: Prepared by the authors based on SPSS outputs

The data assesses the role of Artificial Intelligence (AI) in digital marketing based on eight statements, rated for their average agreement and standard deviation, with most ratings indicating a "high" degree of responsiveness.

6.1.AI Revolutionizing Digital Marketing (Statement 17):
The highest rating (4.08) indicates strong agreement that AI is revolutionizing digital marketing by automating tasks and improving processes. A low standard deviation (0.79) shows consistent opinions on this.

6.2. Natural Language Processing & Customer Sentiment :
AI's use of natural language processing (NLP) to interpret customer sentiment has a high average score (3.76) with a relatively higher standard deviation (0.95), showing slight variation in responses.

6.3. AI-Generated Content & ROI Optimization (Statements 19 & 20):
Automated content generation scores lower (3.59), falling into the "middle" responsiveness category, while AI-based ad optimization for ROI has a higher rating (3.81), indicating it's viewed as more impactful.

6.4. AI Driving Innovation and Personalization (Statements 21-23):
AI's role in driving marketing strategies (3.95), improving user experience (3.89), and powering chatbots (3.89) are rated consistently high, suggesting strong agreement that AI enhances marketing innovation and customer interaction.

6.5. AI's Role in Data-Driven Decisions (Statement 24):
AI-powered insights and strategies driving targeted campaigns also score high (3.81), with a notably low standard deviation (0.62), reflecting strong consensus.

Table (05): the test of validity and reliability of the survey using Crombach's alpha coefficient

Number of items	Cronbach'sAlpha
24	0.835

Source: Prepared by the authors based on SPSS outputs

Cronbach's Alpha is a measure used to assess the internal consistency or reliability of a set of survey items. It indicates how well the items in a survey or test measure the same underlying construct. Values of Cronbach's Alpha range from 0 to 1, with higher values indicating greater reliability. The survey demonstrates good internal consistency with a Cronbach's Alpha of 0.835. This suggests that the 24 items are reliably measuring the intended construct, and the survey is valid for collecting consistent data across its items.

7. Key Insights:

7.1. Number of Items:
The survey consists of 24 items, which is a moderately sized set of questions for reliability testing. Having a sufficient number of items helps ensure that the survey adequately captures the intended construct.

7.2. Cronbach's Alpha Value:
The calculated Cronbach's Alpha is **0.835**, which is a strong indicator of reliability. Generally, a value above **0.7** is considered acceptable, and a value above **0.8** is regarded as good. Hence, a value of 0.835 suggests the survey items are consistent and reliable for measuring the desired factors.

Table (06): the correlation coefficient

Correlations			
		X	**Y**
X	**Pearson Correlation**	1	.516**
	Sig. (2-tailed)		.001
	N	37	37
Y	**Pearson Correlation**	.516**	1
	Sig. (2-tailed)	.001	
	N	37	37

Source: Prepared by the authors based on SPSS outputs

The data shows a **moderate positive correlation** (r = 0.516) between artificial intelligence and electronic marketing, with a statistically significant relationship (p = 0.001). This suggests that increased and effective use of artificial intelligence positively influences the success of electronic marketing efforts. As AI implementation becomes more prevalent, electronic marketing strategies are likely to become more effective.

8. Analysis of Correlation Between Artificial Intelligence (X) and Electronic Marketing (Y):

1. **Correlation Coefficient (Pearson Correlation):** The **Pearson correlation coefficient** between X (Artificial Intelligence) and Y (Electronic Marketing) is **0.516**. This indicates a **moderate positive correlation**. A value of 0.516 suggests that as the use of artificial intelligence increases, the success of electronic marketing also tends to increase, though not perfectly.
2. **Significance Level (Sig. 2-tailed):** The **p-value** is **0.001**, which is much lower than the common threshold of 0.05. This means the correlation is statistically significant, providing strong evidence that the relationship between artificial intelligence and electronic marketing is not due to chance.
3. **Sample Size (N):** The sample size for this analysis is **37**. While this is a relatively small sample, the statistical significance (p = 0.001) indicates that the findings are robust enough to support the observed correlation.

9. Testing the study hypotheses.

Null hypothesis (H_0): Artificial intelligence has no statistically significant impact on digital marketing at the 0.05 significance level.

Table (07): regression coefficient

hypothesis	R	R2	t	F	sig
There is a statistically significant effect of artificial intelligence ondigital marketing	0.516	0.266	3.561	0.791	0.001

Source: Prepared by the authors based on SPSS outputs

Alternative hypothesis (H_1): Artificial intelligence has a statistically significant impact on digital marketing at the 0.05 significance level.

Correlation Coefficient (R): 0.516
This indicates a moderate positive correlation between artificial intelligence and digital marketing.

Coefficient of Determination (R^2): 0.266
This means that 26.6% of the variance in digital marketing can be explained by artificial intelligence. Although this is not very high, it suggests that AI has some influence on digital marketing.

t-value: 3.561
The t-value measures how many standard deviations the sample statistic is from the population parameter. A t-value of 3.561 is quite significant.

F-value: 0.791
The F-statistic tests whether at least one predictor variable in the model is statistically significant. While the F-value here appears low, significance levels are more relevant for decision-making.

Significance (p-value): 0.001

The p-value of 0.001 is lower than the threshold of 0.05, indicating that the results are statistically significant (Cain, 2017).
The data shows strong agreement that AI is a key pillar of digital marketing, automating processes, improving user experience, and driving innovative strategies. While there is high confidence in AI's transformative impact on ad optimization, chatbots, and data-driven decisions, automated content generation is seen as slightly less effective. Overall, AI's role in digital marketing is recognized as highly influential and beneficial.
The data suggests that while the organization shows moderate responsiveness in AI training and awareness, individuals have a strong understanding of AI's capabilities, especially its efficiency and transformative potential. The organization might benefit from increasing efforts to train and raise awareness of AI among employees, as there is already a strong belief in its importance and usefulness.

Table (08): the regression coefficient

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	.259	1.011		.256	.800
	X	.898	.252	.516	3.561	.001

Source: Prepared by the authors based on SPSS outputs

Null Hypothesis (H_0): Artificial intelligence has no statistically significant impact on digital marketing.

Alternative Hypothesis (H_1): Artificial intelligence has a statistically significant impact on digital marketing.

Given that the p-value is 0.001, which is well below the significance level of 0.05, we **reject the null hypothesis (H_0)**. The data provides strong evidence that **artificial intelligence has a statistically significant positive impact on digital marketing**.

IV . Results Analysis

1. In The organization has moderate efforts in AI training and awareness, but individuals have a strong understanding of its potential. There is a high belief in AI's role in achieving goals and transforming industries, suggesting a need for more focus on AI training to align organizational practices with employees' positive perception of AI.
2. AI is viewed as a transformative force in digital marketing, automating tasks, optimizing ads, and enhancing user experiences with high responsiveness. While automated content generation received a moderate rating, AI's role in innovation and driving targeted strategies is strongly supported, marking it as a pillar in the digital marketing landscape.
3. The survey's reliability is confirmed with a Cronbach's Alpha of 0.835, indicating good internal consistency across the 24 items, making it a dependable tool for measuring the intended factors.
4. The correlation coefficient of 0.516 shows a moderate, statistically significant positive relationship between artificial intelligence and electronic marketing. This means that as AI usage increases, the success of electronic marketing improves, highlighting the value of AI in marketing strategies.
5. Thus, the alternative hypothesis (H_1) is supported, indicating a meaningful relationship between artificial intelligence and digital marketing.
6. There is a modest tendency for individuals aged 35-55 to adopt artificial intelligence, primarily due to insufficient updates in scientific knowledge to meet the evolving demands of AI regulation.
7. There is resistance to transitioning from traditional marketing to digital marketing among professionals with over 16 years of experience.

Recommendation:

1. Promote continuous education and knowledge updates in artificial intelligence for individuals aged 35-55 to align with evolving AI regulations, encouraging greater adoption within this demographic.
2. Provide targeted training and support to professionals with over 16 years of experience to facilitate their transition from traditional to digital marketing
3. Increased focus on AI training is needed to align organizational practices with employees' positive perception of AI
4. This emphasizes AI's critical impact on efficiency and strategy, despite moderate reception in content generation.
5. Increased AI usage enhances the success of electronic marketing, emphasizing the importance of AI in marketing strategies.

References

1, X.-L. Y. (2023). Artificial intelligence for detecting and delineating the extent of superficial esophageal squamous cell carcinoma and precancerous lesions under narrow-band imaging . *Gastrointestinal Endoscopy*, 664-672.e4.

A. Tealab, H. H. (2017). Forecasting of nonlinear time series using ANN, Future Comput. *Inform*, 39--47.

Ai-Chu Elisha Ding a, *. L. (2024). Enhancing teacher AI literacy and integration through different types of cases in teacher professional development. *Computers and Education Open*.

Alexandros Gazos a, ∗. J. (2025). Organising AI for safety: Identifying structural vulnerabilities to guide the design of AI-enhanced socio-technical systems. *Safety Science*.

Almestarihi, R.-A. (2024). Measuring the ROI of paid advertising campaigns in digital marketing and its effect on business profitability. *.Uncerta in Supply Chain Management,*, 1275–1284.

Aman Pathak *, V. B. (2024). AI as decision aid or delegated agent: The effects of trust dimensions on the adoption of AI digital agents. *Computers in Human Behavior: Artificial Humans*.

Anne-Kathrin Kleine a, *. I. (2025). Exploring predictors of AI chatbot usage intensity among students: Within and between-person relationships based on the technology acceptance model. *Computers in Human Behavior: Artificial Humans*.

BPS. (2023). Gross regional domestic product of regencies. *Statistics Indonesia*.

Brunborg, G. (Journal of Adolescenc). Increase in time spenton social media is associated with a modest increase in depression, conduct problems,and episodic heavy drinking. *2019*, 201–209.

Cain, M. K.-H. (2017). Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation. *Behavior Research Methods,*, 1716e1735.

Caiyuan Ma a, B. W. (2025). What determines the effectiveness of social media influencer marketing? An fsQCA-based study of influencer characteristics and content features' configurational effects. *Journal of Business Research*.

Campbell, C. (2020). From data toaction: Howma rketersc anleverage Ai. *Businesshorizons,*, 227–243.

Carsten Lund Pedersen a, T. R. (2024). Digital authenticity: Towards a research agenda for the AI-driven fifth phase of digitalization in business-to-business marketing. *Industrial Marketing Management*, 162-172.

Carsten Lund Pedersen a, T. R. (2024). Digital authenticity: Towards a research agenda for the AI-driven fifth phase of digitalization in business-to-business marketing. *Industrial Marketing Management*, 163.

D.W. Otter, J. M. (2020). A survey of the usages of deep learning for natural language processing,. *IEEE Trans. Neural Netw*, 604--624.

Gerard LF, L. M. (2016). Using automated scores of student essays to support teacher guidance in classroom inquiry. *J Sci Teach Educ*, 111–29.

Global X, 2. A.-A. (2023, November 13). *globalxetfs*. Récupéré sur https://www.globalxetfs.com/funds/aiq: https://www.globalxetfs.com/funds/aiq/

Grandhi, B. (2021). Data-driven marketing for growth and profit-ability. *EuroMed Journal of Business,16(4)*, 381.

Grandhi, B. (2021). Data-driven marketing for growth and profit-ability . *Euro MedJournal of Business,*, 381–398.

Grandhi, B. (2021). Data-drivenmarketingforgrowthandprofit-ability. *EuroMedJournalofBusiness,*, 381–398.

Haenlein, M. &. (2021). Artificial intelligence and robotics: Shaking up the business world and society at large. *Journal of Business Research*, 405–407.

Haenlein, M. &. (2019). (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California Management Review*, 5-14.

Innovation, J. o. (2024). IsAI-baseddigitalmarketingethical?Assessinganewdataprivacyparadox. 1.

Kaplan, A. (2022). Artificial intelligence, business and civilization: Our fate made in machines. *London and New York: Routledge*.

Lennart Ante a, c. ,. (2025). Quantifying a firm's AI engagement: Constructing objective, data-driven, AI stock indices using 10-K filings. *Technological Forecasting & Social Change*.

Liron Pantanowitz, T. P. (2024). Non-Generative Artificial Intelligence (AI) in Medicine: Advancements and Applications in Supervised and Unsupervised Machine Learning. *Journal Pre-proof*.

Mochamad Nurhadi a, *. T. (xxxxxxx). Cultivating domestic brand love through social media marketing activities: :Insights from young consumers in an emerging market. *Asia Pacific Management Review*.

Nadav Cohen ∗, I. K. (2024). Inertial Navigation Meets Deep Learning: A Survey of Current Trends and Future Directions. *Results in Engineering*.

Nguyen, Q. N. (2022). User interactions with chatbot interfaces vs. Menu-based interfaces: An empirical study. . *Computers in Human Behavior*, 1-9.

Schulman, P. R. (2007). Designing infrastructures: Dilemmas of design and the reliability of critical infrastructures. *J. Conting. Crisis Manag*, 2–49.

Verhagen, T. v. (2014). Virtual customer service agents: Using social presence and personalization to shape online service encounters. *Journal of Computer-Mediated Communication*, 529–545.

Viererbl, B. D. (2022). You don’t meet anybody when walking from the living room to the kitchen : Informal communication during remote work. *Journal of Communication Management*, 331–348.

Vrontis, D. C. (2022). Artificial intelligence, robotics, advanced technologies and human resource management: A systematic review. *The International Journal of Human Resource Management*, 1237–1266.

Wim Biemans a, *. A. (2024). How marketing and sales use digital tools for innovation ideation. *Industrial Marketing Management*, 304–316.