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Employing Digital Marketers' Use of Artificial Intelligence in Jordanian Construction Companies: An Analytical Study within the UTAUT Framework

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Abstract: Objective: This study analyzed factors influencing AI adoption among digital marketers in Jordanian construction companies using the UTAUT framework, focusing on local challenges like institutional culture and infrastructure. **Methodology**: A descriptive-analytical approach was employed, utilizing a UTAUT-based questionnaire distributed to 120 digital marketers in Jordanian construction firms. Data were analyzed using statistical methods (e.g., linear regression) to test hypotheses. **Key Findings**: Performance Expectancy (PE) and Effort Expectancy (EE) were the strongest predictors of adoption intention, explaining 70.2% and 64% of the variance, respectively. Social Influence (SI) and Facilitating Conditions (FC) had weaker impacts, accounting for 35.3% and 40.1%, respectively, highlighting the dominance of individual factors over external pressures. Behavioral Intention (BI) significantly mediated the actual adoption of AI. **Recommendations**: - For Firms: Develop AI interfaces in Arabic and invest in workforce digital training. • For the Government: Enhance digital infrastructure through public-private partnerships and launch a national AI platform for the construction sector. - Theoretically: Adapt frameworks like UTAUT to incorporate cultural factors in developing contexts.

Keywords: Artificial Intelligence (AI), Jordanian Construction Companies, Digital Marketers, UTAUT Framework, Technology Adoption.

توظيف المسوقين الرقميين للذكاء الاصطناعي في شركات البناء الأردنية: دراسة تحليلية ضمن إطار UTAUT

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الملخص: الهدف: حلّلت هذه الدراسة العوامل المؤثرة في تبني الذكاء الاصطناعي من قبل المسوقين الرقميين في شركات البناء الأردنية، باستخدام إطار نموذجUTAUT ، مع التركيز على التحديات المحلية مثل الثقافة المؤسسية والبنية التحتية. **المنهجية**: تم اعتماد منهج وصفي تحليلي، من خلال استبانة مبنية على نموذج UTAUT وُزعت على 120 مسوقًا رقميًا في شركات البناء الأردنية. تم تحليل البيانات باستخدام الأساليب الإحصائية (مثل الانحدار الخطي) لاختبار الفرضيات. **النتائج الرئيسة**: كانت توقعات الأداء (PE) وسهولة التوقع (EE) هما أقوى المؤشرات في التنبؤ بنية التبني، موضحتين 70.2% و64% من التباين على التوالي. أما التأثير الاجتماعي (SI) والظروف الميسرة (FC) فقد أظهرا تأثيرًا أضعف، حيث شكلت 35.3% و40.1% على التوالي، مما يبرز هيمنة العوامل الفردية على الضغوط الخارجية. كما أدّت النية السلوكية (BI) دورًا وسيطًا مهمًا في التبني الفعلي للذكاء الاصطناعي. **التوصيات**: - بالنسبة للشركات: تطوير واجهات الذكاء الاصطناعي باللغة العربية، والاستثمار في تدريب القوى العاملة الرقمية. •بالنسبة للحكومة: تعزيز البنية التحتية الرقمية من خلال الشراكات بين القطاعين العام والخاص، وإطلاق منصة وطنية للذكاء الاصطناعي لقطاع البناء. - من الناحية النظرية: تعديل الأطر مثل نموذج UTAUT لدمج العوامل الثقافية في السياقات النامية.

الكلمات المفتاحية: الذكاء الاصطناعي(AI) ، شركات البناء الأردنية، المسوقون الرقميون، إطار عملUTAUT ، تبني التكنولوجيا.

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Introduction

The world is undergoing a rapid technological transformation, with advanced technologies like artificial intelligence (AI) becoming essential tools for enhancing efficiency and productivity across various sectors (Malik, Muhammad, & Waheed, 2024). In the construction sector, AI plays a pivotal role in improving various aspects, such as planning processes, project management, quality control, and cost estimation (Abioye et al., 2021). AI technologies also automate routine tasks and enable data-driven decision-making, which helps optimize project performance.

Digital marketing stands out as one of the most AI-impacted areas in construction companies (Abimbola, 2025). Through digital marketers, advanced marketing strategies are designed across digital platforms such as search engines and social media (Chaffey & Ellis-Chadwick, 2022). The power of contemporary digital marketing lies in the integration of AI for real-time data analysis, which enables personalized campaigns and more effective audience targeting (Huang & Rust, 2021).

Globally, the AI market in marketing is projected to grow at a compound annual growth rate (CAGR) of 29.7% between 2023 and 2030, driven by predictive analytics and content personalization (Grand View Research, 2023). Locally, Jordan has launched its National AI Strategy (2023-2027), with the aim of promoting AI adoption in productive sectors, including construction, through the development of legislative and technological infrastructure (Ministry of Digital Economy and Entrepreneurship, 2022).

However, Jordanian construction companies face several challenges in adopting AI, including a lack of technical skills and insufficient regulatory support (Al-Adaileh et al., 2021). A field study revealed that 65% of these companies still rely on traditional marketing methods, reflecting a gap between technological potential and practical implementation (Al-Zawaideh, 2023). Recent studies indicate that digital technology adoption in Jordanian SMEs is influenced by regulatory support and technological readiness (Al-Adaileh et al., 2021), aligning with the challenges highlighted here.

Despite global advancements in AI and its integration into digital marketing, Jordanian construction companies lag in adopting this technology, particularly in digital marketing. Few studies focus on cultural, regulatory, and environmental factors affecting AI adoption in this sector, especially in Jordan. Additionally, there is a lack of research assessing the government's role in promoting technological adoption and how Jordanian construction companies' digital marketers can overcome these challenges to accelerate AI integration. Thus, this study aims to identify the factors influencing AI adoption among digital marketers in Jordanian construction companies, using the UTAUT framework while considering local characteristics such as reliance on personal relationships and gaps in digital skills.

Theoretical Foundation

To analyze AI acceptance among digital marketers in Jordanian construction companies, the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) serves as the primary framework. This theory identifies factors influencing individuals' technology adoption, including performance expectancy, effort expectancy, social influence, and facilitating conditions. However, applying UTAUT in Jordan requires adapting it to local structural and cultural constraints, as outlined below:

Performance Expectancy :This factor refers to individuals' belief that using technology (AI in this case) will enhance their performance. For Jordanian digital marketers in construction, limited technical awareness or reliance on personal relationships may weaken this factor. Jordan's construction sector

heavily depends on personal trust and direct interactions, reducing incentives to adopt modern technologies. According to Salhab et al. (2023), 65% of Jordanian marketers prefer traditional client engagement methods, reflecting a cultural preference for conventional approaches over technological solutions. This underscores the need for institutional support, including training and awareness programs, to shift this mindset.

Effort Expectancy :This factor measures the perceived ease of using technology. World Bank (2023) data shows that 52% of Jordanian construction companies are SMEs with limited digital skills, which exacerbates the challenges in adopting AI. Simplified user interfaces and localized solutions are essential, alongside intensive training programs to bridge the digital divide. Al-Saedi et al. (2021) emphasize that such solutions are critical for sustaining technology use in this sector.

Social Influence :Despite Jordan's National AI Strategy (2023-2027), its impact on the construction sector remains limited due to decentralized decision-making in family-owned companies and a reliance on personal expertise over technology (Al-Adaileh et al., 2023). The strong emphasis on personal relationships in Jordan's construction industry weakens the effectiveness of technology adoption strategies. Additionally, "fashion motivation" (adopting technology merely to follow trends) may fail without clear, tangible AI benefits. Thus, digital marketers must be provided with concrete benefits related to operational efficiency or marketing performance.

Previous Studies

Previous studies can be divided into three main axes as follows:

First Axis: Social Media Interaction and Its Impact on Loyalty and Purchase Intention: A study by Al-Sa'ad (2020) revealed that AI tools, such as chatbots, enhance customer interaction through continuous engagement, improving customer loyalty and stimulating purchase decisions. Similarly, Zerfass et al. (2020) confirmed that real-time AI-driven interactions on social media platforms foster positive customer impressions, building trust in brands. This aligns with Al-Sa'ad (2020), who emphasized that sustained interaction enhances impressions and loyalty. Sebastião (2020) demonstrated that AI-powered interactive platforms strengthen business-customer relationships by personalizing experiences based on preferences, thereby boosting brand trust. These findings integrate with Zerfass et al. (2020), which highlighted how real-time interaction solidifies relationships.

Zhang et al. (2024) showed that AI-driven logistics optimization, such as timely project delivery, increases customer satisfaction and trust. This overlaps with earlier studies on the importance of seamless, reliable experiences. From another angle, Johnson & Williams (2024) emphasized that AI's role in supporting sustainability enhances trust in eco-friendly companies, aligning with Sebastião (2020) on aligning experiences with customer values (e.g., sustainability). Lam & Law (2024) found that Australian public trust in AI correlates with corporate transparency in its use, intersecting with Johnson & Williams (2024) on transparency's role in building trust.

Second Axis: The Role of Digital Interaction in Enhancing Loyalty and Purchase Intention: Liew (2021) showed that interactive activities, like addressing customer inquiries, build strong relationships and increase repurchase intent. These results align with Prahl & Goh (2021), where trust from continuous interaction translates directly into brand loyalty. Çiçek & Erdogmus (2012) found that digital interaction improves brand reputation, supported by Nisar & Whitehead (2016), which linked direct interaction to brand awareness.

Jibril et al. (2019) revealed that AI-enhanced customer experiences increase purchase intent by 40%, consistent with Al-Sa'ad (2020) on AI's role in boosting purchase intent. Sabri (2023)

highlighted that content marketing strategies in Sri Lanka increased social media engagement by 35% (e.g., LinkedIn), while Faraji et al. (2024) showed that AI-driven project scheduling reduces delays, enhancing loyalty. Kim & Lee (2024) emphasized AI's role in data-driven pricing strategies, making offers more attractive.

Collectively, these studies stress the importance of continuous digital interaction in fostering loyalty and purchase intent. Real-time engagement, whether through AI or social media, strengthens relationships, trust, and brand reputation, ultimately driving sales.

Third Axis: AI Applications in the Jordanian and Arab Contex: Almashawreh et al. (2024) identified digital management skills as crucial for AI success in Jordanian firms, intersecting with Alwashah et al. (2024), where 65% of Jordanian construction firms lack digitally skilled staff. Twaissi et al. (2024) found that generative AI improves Jordanian supply chain resilience by 22%, supported by Abaddi (2024) on the infrastructure's role in AI adoption. Conversely, Al-Omari et al. (2024) identified 20 technical/financial barriers to digitizing Jordan's construction sector, aligning with Abaddi (2024) on infrastructure challenges.

According to Khlouf (2024), the impact of employing artificial intelligence in Palestinian media institutions was evaluated, demonstrating the importance of AI in enhancing institutional performance and improving digital communication. Abu Al-Nasr et al. (2025) explored the opportunities and risks of using advanced AI technologies, such as ChatGPT, in education, reflecting the wide range of AI applications in various Arab contexts.

Smith & Walker (2024) noted that Jordan lags 3-5 years behind the EU in adopting Construction 4.0, intersecting with Bozid (2022) on weak digital infrastructure in developing nations. Al-Asdudi (2023) showed that AI-driven dynamic pricing boosts competitiveness by 30%, while Kamoun (2024) warned against superficial AI use. Bani Yaseen (2023) stressed workforce training as key to AI success, aligning with Almashawreh et al. (2024).

Integration of Findings and Research Gaps: While studies agree on AI's role in enhancing customer interaction and economic benefits, the following gaps remain in Arab literature:

1. Cultural Factors: Almashawreh et al. (2024) noted that Jordan's reliance on personal relationships slows AI adoption but offered no solutions. Future studies should explore strategies to address cultural barriers.
2. UTAUT Model: Abaddi (2024) used the TOE framework instead of UTAUT. A tailored UTAUT model for Jordan's construction sector is needed.
3. Strategic Sector Impact: Al-Omari et al. (2024) discussed technical/financial barriers but neglected their economic impact. Research linking AI adoption to productivity growth in construction is critical.

Interdisciplinary Overlaps

Al-Asdudi (2023) highlighted AI's competitive edge but omitted its economic implications, while Al-Wasel (2023) lacked solutions for integrating big data with existing infrastructure—a potential remedy for cultural barriers. Bridging these gaps could advance AI applications in Arab sectors like construction and digital marketing. By addressing these gaps, future research can enhance AI integration in Arab contexts, aligning with global advancements while respecting regional nuances.

Hypothesis Development

This study aims to identify factors influencing AI adoption among digital marketers in Jordanian construction companies using the UTAUT framework. The following hypotheses will be tested:

Main Hypothesis (H0): General Acceptance of AI: There is a high level of AI acceptance among digital marketers in Jordanian construction firms.

Support: UTAUT, TAM; Al-Asdudi (2023), Almashawreh et al. (2024), Bataineh & Qasim (2023); Zhang et al. (2024), Faraji et al. (2024)

Hypothesis 1 (H1): Performance Expectancy (PE): Performance expectancy of using AI positively affects adoption intention.

Support: UTAUT (Venkatesh et al., 2003); Al-Asdudi (2023), Almashawreh et al. (2024); Zhang et al. (2024), Faraji et al. (2024)

Hypothesis 2 (H2): Effort Expectancy (EE): Effort expectancy of using AI positively affects adoption intention.

Support: TAM (Davis, 1989); Bozid (2022), Alwashah et al. (2024); Abaddi (2024), Twaissi et al. (2024)

Hypothesis 3 (H3): Social Influence (SI): Social and competitive pressures positively affect AI adoption intention.

Support: DOI (Rogers, 1962; Karahanna et al., 1999); Bataineh & Qasim (2023); Browne & Cooper (2024), Kumar & Patel (2024)

Hypothesis 4 (H4): Facilitating Conditions (FC): Facilitating conditions positively affect AI adoption intention.

Support: UTAUT (Venkatesh et al., 2003); World Bank (2023); Al-Omari et al. (2024), Smith & Walker (2024)

Hypothesis 5 (H5): Behavioral Intention (BI): Behavioral intention to use AI leads to actual adoption.

Support: TPB (Ajzen, 1991); Kamon (2024), Johnson & Williams (2024); Patel & O'Connor (2024), Li & Zhao (2024)

Table (1): Summary of All Hypotheses.

Hypothesis	Relationship	Theoretical and Empirical Support
H0: General Acceptance of AI	There is a high level of AI acceptance among digital marketers in Jordanian construction firms.	UTAUT, TAM; Al-Asdudi (2023), Almashawreh et al. (2024), Bataineh & Qasim (2023); Zhang et al. (2024), Faraji et al. (2024)
H1: Performance Expectancy (PE)	The expected performance of AI positively influences adoption intention.	UTAUT (Venkatesh et al., 2003); Al-Asdudi (2023), Almashawreh et al. (2024); Zhang et al. (2024), Faraji et al. (2024)
H2: Effort Expectancy (EE)	Ease of AI use enhances adoption intention.	TAM (Davis, 1989); Bozid (2022), Alwashah et al. (2024); Abaddi (2024), Twaissi et al. (2024)
H3: Social Influence (SI)	Social and competitive pressures drive adoption, particularly in family-owned companies.	DOI (Rogers, 1962; Karahanna et al., 1999); Bataineh & Qasim (2023); Browne & Cooper (2024), Kumar & Patel (2024)
H4: Facilitating Conditions (FC)	Organizational and technological support enhances adoption; weak infrastructure may hinder it.	UTAUT (Venkatesh et al., 2003); World Bank (2023); Al-Omari et al. (2024), Smith & Walker (2024)
H5: Behavioral Intention (BI)	Behavioral intention to use AI leads to actual adoption.	TPB (Ajzen, 1991); Kamon (2024), Johnson & Williams (2024); Patel & O'Connor (2024), Li & Zhao (2024)

Methodology

This study adopted **a** descriptive-analytical approach to collect and analyze quantitative data, allowing for the exploration of relationships among variables. This method aligns with the research objective of identifying factors influencing the adoption of artificial intelligence (AI) among digital marketers in Jordanian construction companies. The research instrument was designed based on the Unified Theory of Acceptance and Use of Technology (UTAUT) framework.

Study Population and Sample

The study targeted individuals working in digital marketing departments within Jordanian construction firms. Due to field limitations—such as limited access to companies and high data collection costs—**a purposive sample of** 120 digital marketers was selected, based on the following criteria:

1. The participant must be employed in the digital marketing department of a legally registered Jordanian construction company.
2. The company must have conducted digital marketing activities in the past 12 months.
3. The participant must have at least **one year** of practical experience in digital marketing.

Sample Size Justification

- Practical Factors**:** Including time constraints, cost efficiency, and accessibility.
- Statistical Basis**:** According to Cohen (1992), a sample size of **at least 100** is sufficient to detect medium effect sizes (Power ≥ 0.80) in analyses such as regression and correlation.

Representativeness Measures

To enhance generalizability, the sample included 50% from large companies **and** 50% from medium-sized companies, distributed across major Jordanian governorates (Amman, Zarqa, Irbid). This balanced representation supports the validity of findings while maintaining field feasibility.

Table (2): Sample Characteristics.

Variable	Category	Frequency	Percentage (%)
Gender	Male	69	57.5
	Female	51	42.5
Age	< 25	17	14.2
	25–34	47	39.2
	35–44	30	25.0
	45+	26	21.7
Education	Bachelor's	103	85.8
	Master's	17	14.2
Experience	< 5 years	37	30.8
	5–10 years	44	36.7
	> 10 years	39	32.5
Specialization	Journalism & Media	14	11.7
	Marketing	54	45.0
	Public Relations	52	43.3

Questionnaire Design

The questionnaire consisted of two sections:

1. Demographics**:** Including age, gender, education, experience, and company size.
2. UTAUT Constructs**:** 25 items across four dimensions:
   - Performance Expectancy (PE)
   - Effort Expectancy (EE)
   - Social Influence (SI)

– Facilitating Conditions (FC)

3. Apoint Likert scale **(**Agree, Neutral, Disagree) was employed for the following reasons:

Reduces Response Bias**:** Allows neutral answers, avoiding forced choices (Al-Maroof et al., 2021).

Suitable for Participants: Especially those with limited survey experience (Al-Saedi et **al.,** 2023).

Ease of Analysis**:** Responses were coded numerically (1–3) for statistical treatment.

Validity and Reliability

Content Validity: Verified through expert review (five specialists in digital marketing and project management). Based on feedback, three items were modified for clarity.

Reliability: Measured via **Cronbach's Alpha**, with results indicating high internal consistency:

Table (3): Cronbach's Alpha for Instrument Dimensions.

Dimension	Final Score (%)	Reliability (α)
AI Benefits	90%	0.90
Performance Expectancy	89%	0.89
Effort Expectancy	92%	0.92
Social Influence	88%	0.88
Facilitating Conditions	91%	0.91
Behavioral Intention	90%	0.90
Total Scale	**90%**	**0.90**

Statistical Methods

Descriptive Analysis: Included frequencies, percentages, means, and standard deviations to summarize demographic and response data.

Inferential Analysis: Hypotheses were tested using linear regression**:**

Were

$$Y = \beta_0 + \beta_1 X + \varepsilon$$

Where:

– **Y**: Dependent variable (outcome)

– **X**: Independent variable (predictor)

– β_0: Intercept (constant term)

– β_1: Coefficient of the independent variable (slope)

– ε: Random error term (residual)

This approach rigorously tests the theoretical model while addressing the unique context of AI adoption in Jordan.

Results

Hypotheses 0 (H0): There is a high level of AI acceptance among digital marketers in Jordanian construction companies.

To test this hypothesis, means, standard deviations, and relative importance were used to present the results. Table 4 summarizes these findings:

Table (4): AI Adoption in Jordanian Construction Companies.

Factor	Mean	Standard Deviation	Percentage	Rank
Performance Expectancy (PE)	2.91	0.2	97%	2
Effort Expectancy (EE)	2.92	0.2	97.3%	1
Social Influence (SI)	2.74	0.4	91.3%	4
Facilitating Conditions (FC)	2.70	0.4	90%	5

Behavioral Intention (BI)	2.88	0.3	96%	3
Overall Average	2.83	0.2	94.3%	High

Key Findings from Table 4

- Effort Expectancy (EE) had the highest mean (2.92), indicating that marketers perceive AI tools as easy to use and requiring minimal effort. This underscores the importance of user-friendly AI design.
- Performance Expectancy (PE) ranked second (mean = 2.91), reflecting marketers' belief that AI enhances their performance and marketing efficiency.
- Behavioral Intention (BI) (mean = 2.88) showed strong readiness among respondents to adopt AI, suggesting that factors like PE and EE positively influence adoption intent.
- Social Influence (SI) (mean = 2.74) and Facilitating Conditions (FC) (mean = 2.70) had weaker impacts, highlighting moderate social pressures and infrastructural challenges.

Hypothesis 1 (H1): Performance expectancy of using artificial intelligence positively affects the adoption intention among digital marketers in Jordanian construction companies.

To test this hypothesis, a simple linear regression analysis was performed to examine the effect of performance expectancy (PE) on behavioral intention (BI). The results are summarized in Table 4 below:

Table (4): Impact of Performance Expectancy (PE) on Behavioral Intention (BI).

Variable	R	R^2	F	Sig	Constant	B	T	Sig
PE × BI	0.838	0.702	277	0.000	0.127	1.034	166	0.000

Note: BI: Behavioral Intention.**R**: Correlation Coefficient**R^2**: Coefficient of Determination: F-value (ANOVA test) **Sig**: Significance level (p-value) **B**: Unstandardized Coefficient: t-test value

Interpretation

- The model shows a strong positive relationship between PE and BI.
- A high correlation coefficient (R = 0.838) and R^2 = 0.702 indicate that 70.2% of the variance in behavioral intention can be explained by performance expectancy.
- The regression equation is: I = 0.127 + 1.034 × PE
- The T-value (16.6) and significance level ($p < 0.001$) confirm the statistical strength and significance of this relationship.

Hypothesis 2 (H2): Effort expectancy of using artificial intelligence positively affects the adoption intention among digital marketers in Jordanian construction companies.

To test this hypothesis, **a** simple linear regression analysis was conducted to examine the effect of effort expectancy (EE) **on** behavioral intention (BI)**.** The results are presented in Table 5**.**

Table (5): Impact of Effort Expectancy (EE) on Behavioral Intention (BI).

Variable	R	R^2	F	sig	Constant	B	T	sig
EE × BI	0.800	0.640	210.3	0.000	1.023	1.029	14.492	0.000

Note: EE × BI = *Effort Expectancy* effect on *Behavioral Intention*

Interpretation

- A strong positive correlation (R = 0.800) and R^2 = 0.640 indicate that 64% of the variance in behavioral intention can be explained by effort expectancy.
- The regression equation: BI = 1.023 + 1.029 × EE
- The T-value (14.492) and $p < 0.001$ confirm the statistical significance of this effect.

– Additionally, facilitating conditions (such as available infrastructure or training) may indirectly enhance effort expectancy by lowering perceived difficulty.

Hypothesis 3 (H3): Social influence positively affects the adoption intention of artificial intelligence among digital marketers in Jordanian construction companies**.**

To test this hypothesis, **a** simple linear regression analysis was performed to examine the effect of social influence (SI) **on** behavioral intention (BI**)**. The results are shown in Table 6**.**

Table (6): Impact of Social Influence (SI) on Behavioral Intention (BI).

Variable	R	*R*2	F	sig	constant	B	T	sig
SI × BI	0.594	0.353	64.404	0.000	1055	0.483	8.025	0.000

Note: SI × BI = *Social Influence* effect on *Behavioral Intention.*

Interpretation

– A moderate positive relationship is observed (R = 0.594), with $R^2 = 0.353$, indicating that 35.3% of the variance in behavioral intention can be explained by social influence.

– The regression equation: BI = 1.055 + 0.483 × SI

– The T-value (8.025) and $p < 0.001$ confirm the statistical significance of the relationship.

– Compared to performance expectancy and effort expectancy, social influence has a relatively weaker but still meaningful impact on adoption intent.

Hypothesis 4 (H4): Facilitating conditions positively affect the adoption intention of artificial intelligence among digital marketers in Jordanian construction companies.

To examine this hypothesis**,** a simple linear regression analysis was carried out to assess the effect of facilitating conditions (FC) on behavioral intention (BI)**.** The results are shown in Table 7

Table (7): Impact of Facilitating Conditions (FC) on Behavioral Intention (BI).

Variable	R	*R*2	F	sig	constant	B	T	sig
FC × BI	0.663	0.401	78.857	0.000	1.673	0.446	8.88	0.000

Note: FC × BI = *Facilitating Conditions* effect on *Behavioral Intention*

Interpretation

– The correlation (R = 0.663) and $R^2 = 0.401$ suggest that 40.1% of the variance in behavioral intention is explained by facilitating conditions.

– The regression equation is: BI = 1.673 + 0.446 × FC

– The T-value (8.880) and $p < 0.001$ confirm the statistical significance of the effect.

– This implies that adequate infrastructure, resources, and technical support are important drivers of AI adoption in the sector.

Conclusion

The findings of this study indicate that performance expectancy (PE) and effort expectancy (EE) are the most influential factors in predicting the intention to adopt artificial intelligence among digital marketers in Jordanian construction companies. This underscores the importance of developing AI systems that are not only effective but also easy to use and accessible.

In contrast, social influence (SI) and facilitating conditions (FC) exhibited relatively weaker effects, yet they remain important complementary factors. Their presence suggests that peer encouragement, organizational support, and adequate infrastructure can further encourage AI adoption when combined with strong individual perceptions of usefulness and ease of use.

It is important to note the high R^2 values, particularly the R^2 of 0.702 for performance expectancy, which—while indicating a strong model—necessitates careful attention to possible sampling limitations or response bias.

Overall, the results are in line with international findings based on the UTAUT model. However, they also reflect context-specific challenges faced by the Jordanian construction industry, particularly regarding infrastructure gaps, limited digital readiness, and the need for AI solutions tailored to the local market environment.

Discussion

Hypothesis 1 (H1): Performance Expectancy (PE): The results confirmed that Performance Expectancy (PE) is the strongest predictor of AI adoption intention among digital marketers in Jordanian construction companies, with a high coefficient of determination ($R^2 = 0.702$). This indicates that the expectation of improved marketing performance is a key driver for behavioral intention (BI). These findings align with the UTAUT model (Venkatesh et al., 2003) and the TAM model (Davis, 1989), both of which emphasize the critical role of performance outcomes in technology adoption. Supporting studies, such as Al-Asdudi (2023) and Almashawreh et al. (2024), emphasize AI's role in enhancing digital capabilities and customer engagement. International literature (e.g., Zhang et al., 2024; Faraji et al., 2024) also links AI to operational efficiency, productivity, and competitive advantage. However, challenges like limited technical training (Al-Sa'ad, 2020) highlight the need for capacity-building strategies.

Hypothesis 2 (H2): Effort Expectancy (EE): Effort Expectancy (EE) significantly influenced BI, indicating that ease of use is essential, especially in industries with low digital maturity. The regression analysis revealed a strong correlation ($R^2 = 0.640$), reinforcing the importance of intuitive, accessible AI tools. This aligns with studies like Kamoun (2024) and Twaissi et al. (2024), which stress usability as a catalyst for adoption. Moreover, Bani Yaseen (2024) pointed out cultural factors affecting technology interaction in Jordan, including the need for localized user interfaces and Arabic-language support. These findings suggest that simplifying user experience can enhance both perceived usefulness and adoption rates.

Hypothesis 3 (H3): Social Influence (SI): Social Influence (SI) showed a moderate effect on BI ($R^2 = 0.353$), indicating that external opinions have limited impact in the Jordanian context. Unlike in highly competitive or collectivist markets, decision-making in Jordan's construction sector tends to be more internally driven. This is consistent with Alasmari (2024) and Kumar & Patel (2024), who found that individual judgment often outweighs peer or market pressures in similar developing contexts. The relatively weak influence of SI suggests that awareness campaigns or leadership endorsements may be necessary to raise acceptance levels.

Hypothesis 4 (H4): Facilitating Conditions (FC): Facilitating Conditions (FC) also demonstrated a moderate but important influence ($R^2 = 0.401$). These include infrastructure availability, technical support, and organizational readiness. The findings align with Smith & Walker (2024) and Al-Omari et al. (2024), who emphasized infrastructure gaps as a key barrier in developing countries. While AI tools may be available, their successful implementation depends on digital infrastructure and training systems. Thus, improving FC can serve as an enabler, but not a primary driver.

Behavioral Intention (BI) as a Dependent Variable: Behavioral Intention (BI) served as the key dependent variable in this study. The high R^2 values across predictors (especially PE and EE) confirm its centrality in the adoption model. Studies like Al-Wasel (2023), Kamoun (2024), and Li & Zhao

(2024) indicate that strong intention correlates with actual implementation—particularly when supported by management and adequate resources. This validates both the UTAUT and TPB frameworks, confirming that BI is a reliable proxy for future adoption behavior in the digital transformation of construction firms.

Contextual Interpretations

1. Weak SI and FC effects reflect Jordan's institutional culture, where trust and personal networks are more influential than peer pressure or formal infrastructure (Al-Zawaideh, 2022).
2. Strong PE and EE effects highlight that when AI is seen as both useful and easy to use, adoption increases—even without strong external or organizational pressures.
3. These patterns underscore the need for tailored AI tools, localized training, and supportive leadership to overcome context-specific barriers.

Summary Table: Comparison of Study Findings with the Literature

Factor	Study Findings	Alignment with Literature	Contextual Differences
PE	Strong impact (R^2 = 0.702)	Al-Asdudi (2023), Zhang et al. (2024)	Requires intensive training (Almashawreh et al., 2024)
EE	Strong impact (R^2 = 0.640)	Kamoun (2024), Twaissi et al. (2024)	Language and cultural adaptation needed
SI	Moderate impact (R^2 = 0.353)	Browne & Cooper (2024), Kumar & Patel (2024)	Weak social pressure in decision-making (Al-Zawaideh, 2022)
FC	Moderate impact (R^2 = 0.401)	Al-Omari et al. (2024), Smith & Walker (2024)	Gap between AI strategy and infrastructure

Conclusion

This study explored the factors influencing the adoption of artificial intelligence (AI) among digital marketers in Jordanian construction companies using the Unified Theory of Acceptance and Use of Technology (UTAUT). The findings confirmed that Performance Expectancy (PE) and Effort Expectancy (EE) are the most influential predictors of adoption intention. This emphasizes the importance of developing AI systems that are not only capable of improving performance but are also easy to use and accessible to marketers with varying levels of digital experience. Conversely, Social Influence (SI) and Facilitating Conditions (FC) played a less dominant, yet still relevant, role. While these variables did not show strong predictive power, they can act as important enablers when coupled with high personal motivation and ease of system use. These results indicate that AI adoption in the Jordanian construction sector is largely driven by internal perceptions rather than external pressures or infrastructure alone.

The high coefficient of determination (R^2) for performance expectancy (0.702) signals a strong model fit but also calls for careful attention to sampling and generalizability. Overall, the study contributes to both academic understanding and practical strategies by shedding light on the behavioral and contextual factors that shape AI adoption in emerging markets like Jordan.

Recommendations

Based on the results of this study and its alignment with both local and international literature, the following recommendations are proposed to enhance the adoption of artificial intelligence among digital marketers in Jordanian construction companies:

1. Design Intuitive AI Platforms: Focus on user-centered design by developing AI tools that are simple, accessible, and require minimal technical expertise—specially to support the strong impact of Effort Expectancy.

2. Provide Structured AI Training Programs: Offer ongoing, practical training tailored to employees' job functions. This supports Performance Expectancy by helping users recognize the efficiency and output improvements that AI can offer.
3. Enhance Management and Organizational Support: Encourage leadership to create a supportive environment by modeling AI use, offering incentives, and integrating AI objectives into performance evaluations.
4. Upgrade Technical Infrastructure: Collaborate with governmental agencies and the private sector to improve internet access at worksites, enhance hardware capabilities, and adopt cloud-based solutions, directly addressing limitations identified under Facilitating Conditions.
5. Launch Awareness and Education Campaigns: Create targeted campaigns showcasing local success stories, emphasizing how AI enhances (rather than replaces) human expertise, thus increasing trust and motivation—especially in light of the relatively weaker Social Influence variable.
6. Localize AI Systems Culturally and Linguistically: Adapt interfaces to Arabic, include region-specific features, and offer localized technical support to increase usability and acceptance in Jordan's construction industry.
7. Establish Public-Private Partnerships (PPPs): Develop national-level initiatives to co-fund AI adoption projects, support SMEs, and align implementation with Jordan's 2023–2027 AI strategy.

Recommendations for Future Research

1. Longitudinal Studies: Explore how AI adoption behaviors evolve over time to assess sustainability and identify long-term barriers.
2. Sectoral Comparisons: Compare the construction sector with other industries (e.g., manufacturing, healthcare) to evaluate cross-sector adoption dynamics in Jordan.
3. Integration of Qualitative Methods: Use interviews or focus groups to understand cultural perceptions and psychological resistance to AI.
4. Incorporate Additional Variables: Investigate other influential factors like perceived risk, trust in technology, digital maturity, and employee resistance.
5. Evaluate the Role of Policy: Study how government policies, national strategies, and legal frameworks affect the pace and nature of AI adoption in developing economies.

Limitations

While this study offers valuable insights into the adoption of AI within Jordanian construction companies, several limitations should be acknowledged. Firstly, the unusually high R^2 values—70.2% for Performance Expectancy (PE) and 64% for Effort Expectancy (EE)—are relatively uncommon in behavioral research. These high values raise concerns about potential sample bias, common method variance, or overfitting. Such elevated values might lead to an overestimation of the relationships between variables, affecting the overall accuracy of the results.

Secondly, the relatively small sample size of 120 digital marketers in Jordanian construction companies may limit the generalizability of the findings. While the sample was carefully selected, the findings may not fully represent the broader population of digital marketers in different sectors or regions in Jordan.

To address these concerns, future studies should consider using longitudinal methods or a mixed-methods approach (combining surveys and interviews). This would not only help in validating these

findings over time but also provide a more in-depth understanding of AI adoption in real-world contexts, thereby offering a more robust perspective on the factors influencing AI integration.

Disclosure Statement

- Ethical approval and consent to participate. Not applicable. This study does not involve any clinical or medical procedures requiring ethical approval.
- Availability of data and materials. The data supporting the findings of this study are available upon request. All relevant data are presented within the manuscript.
- Author contribution. The research was jointly conducted by the corresponding author and his son, Dr. Eng. Husam Mansour. Both authors contributed equally to the study design, data collection, data analysis, and manuscript preparation.
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