

RESEARCH ARTICLE



Human–AI Collaboration in Digital Marketing: Evidence from an Emerging Economy, Somalia

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Abstract: Artificial intelligence (AI) is reshaping digital marketing through automation, customer analytics, personalization, and data-driven decision-making. However, empirical evidence on human–AI collaboration in emerging and fragile economies remains limited. This study examined the adoption of human–AI collaboration in digital marketing among businesses in Somalia, identified key barriers to AI adoption, and assessed the association between human–AI collaboration and customer engagement, marketing efficiency, and business growth. The study used a positivist research approach and a quantitative cross-sectional survey design. Data were collected from 86 business owners, marketing managers, digital marketing specialists, and ICT/technology officers using purposive sampling. Data were analyzed using descriptive statistics, Spearman's rank correlation, and multiple linear regression. Respondents reported frequent use of AI-assisted content creation, customer analytics, marketing automation, social media management, and AI-supported decision-making. The principal barriers were limited technical skills, limited infrastructure, implementation costs, data privacy concerns, and organizational resistance to change. Spearman's correlations indicated positive associations between human–AI collaboration and customer engagement ($p = .684$), marketing efficiency ($p = .725$), and business growth ($p = .658$), all reported at $p < .001$. Regression models explained 50.7% of the variance in customer engagement, 54.9% in marketing efficiency, and 46.4% in business growth. Human–AI collaboration was positively associated with each outcome after controlling for organizational size and industry sector. Because the study is cross-sectional and based on a purposive sample, the findings should be interpreted as associations rather than causal effects. The results highlight the importance of combining AI capabilities with human judgment, creativity, contextual knowledge, and responsible data practices in Somalia's digital marketing environment.

Keywords: Artificial intelligence; Human–AI collaboration; Digital marketing; Customer engagement; Marketing efficiency; Business growth; Somalia

1. INTRODUCTION

Digital technologies have transformed marketing by making it more data-driven, automated, and personalized. Artificial intelligence (AI) supports customer segmentation, predictive analytics, conversational technologies, content creation, recommendation systems, and campaign optimization. Research in marketing suggests that AI can augment human decision-making by handling repetitive tasks and processing large volumes of information, while human marketers contribute contextual judgment, creativity, ethical reasoning, and strategic direction (Davenport et al., 2020; Huang & Rust, 2021; Petrescu & Krishen, 2023).

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Digital marketing is particularly relevant in emerging economies because increased internet access, smartphone use, social media adoption, and digital financial services create new channels for customer interaction and business development. Somalia has experienced growth in mobile connectivity and digital financial services, creating opportunities for businesses to engage customers through digital channels (World Bank, 2023). These developments provide a context in which AI-enabled marketing tools may be useful, but adoption may also be constrained by infrastructure, skills, cost, privacy, and governance challenges.

Human–AI collaboration refers in this study to the use of AI capabilities together with human expertise in marketing activities. The collaboration perspective is important because AI and human intelligence have different strengths. AI can support large-scale data processing, automation, and analytical tasks, whereas human actors remain important for contextual interpretation, creativity, relationship management, and ethical judgment (Huang & Rust, 2022; Petrescu & Krishen, 2023).

Evidence from developing and emerging markets indicates that AI adoption is uneven and shaped by organizational capabilities, infrastructure, employee skills, financial resources, and concerns about data privacy and responsible use. These issues may be especially relevant in fragile digital ecosystems, where technological development can move faster than institutional capacity and regulatory arrangements.

Despite growing international interest in AI-enabled marketing, empirical evidence focused specifically on human–AI collaboration in Somalia remains limited. This study therefore investigates AI-supported marketing practices among businesses operating in Somalia, identifies barriers to adoption, and examines the statistical associations between human–AI collaboration and three organizational outcomes: customer engagement, marketing efficiency, and business growth.

2. RESEARCH OBJECTIVES

To examine the level of adoption of human–AI collaboration in digital marketing activities among businesses in Somalia.

To identify the key challenges affecting the adoption of AI technologies in digital marketing among businesses in Somalia.

To assess the association between human–AI collaboration and customer engagement, marketing efficiency, and business growth in Somalia.

3. METHODS

3.1. Research Approach and Design

The study adopted a positivist research approach and a quantitative cross-sectional survey design. The approach was selected because the study sought to measure reported AI adoption practices, perceived barriers, and organizational outcomes using structured quantitative data. The cross-sectional design captured respondents' perceptions and reported practices at a single point in time. Accordingly, the study examines statistical associations rather than causal effects.

3.2. Study Population

The target population comprised business owners, marketing managers, digital marketing specialists, and ICT/technology personnel involved in digital marketing activities within businesses operating in Somalia. Participants were considered appropriate because their roles provide direct knowledge of digital marketing practices and the use of AI-related tools. The study focused on businesses using digital channels such as social media, websites, e-commerce platforms, and mobile applications.

3.3. Sample and Sampling Technique

A total of 86 respondents were selected using purposive sampling. Participants were selected because of their involvement in digital marketing and familiarity with AI-related technologies. The sample comprised business owners, marketing managers, digital marketing specialists, and ICT/technology officers.

3.4. Data Collection Instrument

Data were collected using a structured questionnaire consisting primarily of closed-ended items measured on a five-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The questionnaire contained four sections:

Section A: demographic and organizational information, including gender, age, organizational role, relevant work experience, type of business, organizational size, and industry sector.

Section B: human–AI collaboration adoption, covering AI-assisted content creation, customer analytics, marketing automation, social media management, and AI-supported decision-making.

Section C: barriers to AI adoption, including technical skills, implementation costs, data privacy, technological infrastructure, and organizational resistance to change.

Section D: perceived organizational outcomes associated with human–AI collaboration, focusing on customer engagement, marketing efficiency, and business growth.

3.5. Measurement of Constructs

The study used multi-item constructs to measure human–AI collaboration and the three organizational outcomes. Items were informed by the literature on AI in marketing and human–AI collaboration. The measurement framework was aligned with the variables subsequently analyzed in the results.

Table 1. Measurement of Study Constructs.

Construct	No. of items	Measurement focus	Key sources
Human–AI Collaboration	5	AI support for content creation, analytics, automation, social media management, and decision support.	Huang & Rust (2021, 2022); Petrescu & Krishen (2023)
Customer Engagement	4	Responsiveness, personalization, and continuity of customer interaction.	Huang & Rust (2021, 2022); Petrescu & Krishen (2023)
Marketing Efficiency	4	Time savings, productivity, automation, and campaign optimization.	Davenport et al. (2020); Huang & Rust (2021, 2022)
Business Growth	4	Customer acquisition, market reach, competitiveness, and value creation.	Huang & Rust (2021); Paschen et al. (2022)

3.6. Data Collection Procedure

Questionnaires were distributed electronically through email, WhatsApp, and web-based survey platforms. Participants were informed of the purpose of the study, the voluntary nature of participation, and the confidentiality of their responses. Completed questionnaires were collected electronically and prepared for statistical analysis.

3.7. Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics included frequencies, percentages, means, and standard deviations. Spearman's rank-order correlation was used to examine bivariate associations because the questionnaire responses were measured using Likert-type scales. Multiple linear regression was used to examine the predictive association between human–AI collaboration and each outcome while controlling for organizational size and industry sector. The statistical results are reported using coefficients, R^2 , adjusted R^2 , F-statistics, t-values, p-values, and confidence intervals where available.

3.8. Validity and Reliability

Content validity was addressed by developing questionnaire items from the literature on AI and digital marketing. Internal consistency reliability was assessed using Cronbach's alpha. The reported coefficients were above the commonly used 0.70 threshold.

Construct	Items	Cronbach's α
Human–AI Collaboration	5	0.82
Customer Engagement	4	0.79
Marketing Efficiency	4	0.84
Business Growth	4	0.81

3.9. Ethical Considerations and Common-Method Procedures

Participation was voluntary, informed consent was obtained, confidentiality and anonymity were respected, and data were used for academic purposes. No identifying participant information was reported. Procedural measures included anonymous responses, voluntary participation, and neutral wording.

The manuscript also reports a Harman single-factor test, with the first factor accounting for 38% of the total variance. This is below the 50% heuristic used in the original manuscript. However, Harman's single-factor test alone does not establish that common-method bias is absent; the result is therefore treated as an indicator rather than definitive evidence that common-method bias is not present.

4. RESULTS

4.1. Respondent Characteristics and Demographic/Organizational Profile

Table 2. Demographic and Organizational Characteristics of Respondents (N = 86)

Variable	Category / Measure	Frequency (n)	Percentage (%)
Professional role	Business owners	20	23.26
	Marketing managers	20	23.26
	Digital marketing specialists	30	34.88
	ICT/technology officers	16	18.60
	Total	86	100.00
Gender	Male	53	61.63
	Female	33	38.37
Variable	Category / Measure	Frequency (n)	Percentage (%)
	Total	86	100.00
	18–25 years	11	12.79
	26–35 years	34	39.53
Age	36–45 years	27	31.40
	46–55 years	10	11.63
	56 years and above	4	4.65
	Total	86	100.00

The sample of 86 respondents consisted mainly of digital marketing specialists (34.88%), followed by business owners and marketing managers (23.26% each), with ICT/technology officers forming the smallest group (18.60%). Thus, 81.40% were business, marketing, or digital-marketing personnel, providing both strategic and technical perspectives relevant to human–AI collaboration. Males constituted the majority (61.63%) compared with females (38.37%), indicating a moderate gender imbalance but still a mixed sample. Most respondents were in the 26–35 (39.53%) and 36–45 (31.40%) age brackets, together accounting for 70.93% of the sample. Only 4.65% were 56 years or older. This young-to-mid-career pro-

file is favourable for a study on AI-enabled marketing, as such respondents tend to be more familiar with digital and AI tools.

4.2. Adoption of Human–AI Collaboration

Respondents reported relatively high use of AI-enabled activities in digital marketing. The highest reported mean was for AI-assisted content creation ($M = 4.12$, $SD = 0.78$), followed by customer analytics ($M = 4.08$, $SD = 0.81$), social media management ($M = 4.01$, $SD = 0.76$), marketing automation ($M = 3.95$, $SD = 0.84$), and AI-supported decision-making ($M = 3.88$, $SD = 0.87$).

Table 3. AI Adoption in Digital Marketing

AI-supported activity	Mean	SD
AI-assisted content creation	4.12	0.78
Customer analytics	4.08	0.81
Marketing automation	3.95	0.84
Social media management	4.01	0.76
AI-supported decision-making	3.88	0.87

4.3. Challenges Affecting AI Adoption

The reported barriers were primarily related to technical skills, infrastructure, implementation costs, data privacy, and organizational resistance to change. Lack of technical skills had the highest mean ($M = 4.28$, $SD = 0.73$), followed by limited infrastructure ($M = 4.20$, $SD = 0.76$), high implementation costs ($M = 4.15$, $SD = 0.79$), and data privacy concerns ($M = 4.02$, $SD = 0.82$). Organizational resistance to change had the lowest mean among the listed barriers ($M = 3.72$, $SD = 1.34$), although it remained above the neutral midpoint.

Table 5. Challenges Affecting AI Adoption

Challenge	Mean	SD
Lack of technical skills	4.28	0.73
Limited technological infrastructure	4.20	0.76
High implementation costs	4.15	0.79
Data privacy concerns	4.02	0.82
Organizational resistance to change	3.72	1.34

4.4. Perceived Organizational Outcomes

Respondents reported positive perceptions of the three organizational outcomes. Marketing efficiency had the highest mean ($M = 4.25$, $SD = 0.68$), followed by customer engagement ($M = 4.18$, $SD = 0.71$) and business growth ($M = 4.10$, $SD = 0.75$).

Table 6. Perceived Organizational Outcomes of Human–AI Collaboration

Outcome	Mean	SD
Customer engagement	4.18	0.71
Marketing efficiency	4.25	0.68
Business growth	4.10	0.75

4.5. Spearman Rank Correlation Analysis

Spearman's rho was used to examine the bivariate associations between human–AI collaboration and the three outcome variables. All reported correlations were positive and statistically significant at $p < .001$.

Table 7. Spearman Rank Correlation Matrix (N = 86)

Variable	1	2	3	4
1. Human–AI Collaboration	1.000			
2. Customer Engagement	.684***	1.000		
3. Marketing Efficiency	.725***	.652***	.000	
4. Business Growth	.658***	.701***	.683***	1.000

4.6. Multiple Linear Regression Analysis

Three multiple linear regression models were reported, with human–AI collaboration as the focal independent variable and organizational size and industry sector as control variables. The reported models explained 50.7% of the variance in customer engagement, 54.9% in marketing efficiency, and 46.4% in business growth. The corresponding adjusted R^2 values were 48.9%, 53.2%, and 44.4%, respectively.

Table 8. Multiple Linear Regression Model Summary (N = 86)

Dependent variable	R	R ²	Adjusted R ²	Std. error	F	p
Customer engagement	.712	.507	.489	.629	28.11	< .001
Marketing efficiency	.741	.549	.532	.650	33.27	< .001
Business growth	.681	.464	.444	.753	23.66	< .001

The focal independent variable was human–AI collaboration; organizational size and industry sector were included as control variables.

Model 1 explained 50.7% of the variance in customer engagement. Model 2 explained 54.9% of the variance in marketing efficiency. Model 3 explained 46% of the variance in business growth.

*** $p < .001$.

4.7. Regression Coefficients

Table 9. Regression Coefficients for the Three Outcome Models

Outcome	Predictor	B	Beta	t	p	95% CI for B
Customer engagement	Constant	1.12	—	2.45	.017	[0.21, 2.03]
	Human–AI Collaboration	.562	.588	6.82	< .001	[.398, .726]
	Organizational size (log)	.087	.102	1.23	.222	[-.053, .227]
	Industry sector	-.124	-.089	-1.02	.311	[-.366, .118]
Marketing efficiency	Constant	.98	—	2.01	.048	[.01, 1.95]
	Human–AI Collaboration	.643	.623	7.54	< .001	[.473, .813]
	Organizational size (log)	.112	.124	1.56	.123	[-.031, .255]
	Industry sector	-.089	-.060	-0.72	.474	[-.336, .158]
Business growth	Constant	1.45	—	2.56	.013	[.32, 2.58]
	Human–AI Collaboration	.521	.573	6.35	< .001	[.358, .684]
	Organizational size (log)	.143	.149	1.69	.095	[-.025, .311]
	Industry sector	-.211	-.135	-1.52	.132	[-.488, .066]

Abbreviations: B = unstandardized coefficient; Beta = standardized coefficient; CI = confidence interval.

Across the three models, human–AI collaboration was positively associated with each outcome after controlling for organizational size and industry sector. The standardized coefficients were $\beta = .588$ for customer engagement, $\beta = .623$ for marketing efficiency, and $\beta = .573$ for business growth, all with $p < .001$. The control variables were not statistically significant in the reported models. These results indicate statistical association and predictive contribution; they should not be interpreted as evidence of causal impact because the study is cross-sectional.

5. DISCUSSION

5.1. Interpretation of Findings

The results indicate that respondents in Somali businesses reported substantial use of AI-supported activities in digital marketing, particularly content creation, customer analytics, social media management, marketing automation, and decision support. This pattern is consistent with the broader marketing literature, which describes AI as a tool for automation, analysis, personalization, and campaign support (Davenport et al., 2020; Huang & Rust, 2021).

The findings also support the human–AI collaboration perspective. AI can perform high-volume analytical and repetitive tasks, while human marketers provide contextual interpretation, creativity, ethical judgment, and strategic direction. This complementarity is central to collaborative AI frameworks in marketing (Huang & Rust, 2022; Petrescu & Krishen, 2023).

The reported positive association between human–AI collaboration and customer engagement is consistent with the role of AI in personalization, conversational interaction, and customer analytics. In practice, AI-supported responsiveness and analysis may help firms tailor digital interactions, although the present study does not establish a causal mechanism.

The positive association with marketing efficiency is also consistent with the use of AI for automation, data processing, targeting, and campaign support. The relatively high mean for marketing efficiency and the regression result suggest that respondents perceived a relationship between collaborative AI use and more efficient marketing operations.

The association with business growth should likewise be interpreted cautiously. AI-supported segmentation, targeting, customer interaction, and automation may contribute to business performance, but growth is influenced by many factors beyond marketing technology. Because the study used cross-sectional self-reported data, the results show an empirical relationship rather than a demonstrated causal effect.

The barriers identified by respondents—skills, infrastructure, implementation cost, privacy, and organizational resistance—are particularly relevant to emerging and fragile digital environments. These constraints suggest that AI adoption is not only a question of access to software; it also depends on digital capabilities, organizational readiness, reliable infrastructure, and responsible data practices.

5.2. Theoretical and Practical Implications

- The study adds empirical evidence from Somalia to the growing literature on human–AI collaboration in marketing, a literature that has largely developed in more digitally mature settings.
- The findings suggest that human–AI collaboration should be considered as an augmentation approach rather than an assumption that AI automatically replaces marketing professionals.
- For businesses, investment in staff AI literacy, data practices, and digital infrastructure should accompany investment in AI tools.
- For policymakers and higher-education institutions, skills development and responsible AI practices are relevant to strengthening the digital business ecosystem.

5.3. Limitations

- The sample consisted of 86 purposively selected respondents, so the findings should not be generalized to all businesses in Somalia without further evidence.
- The cross-sectional design does not establish temporal order or causality. The terms 'effect' and 'impact' have therefore been replaced throughout this revised manuscript with 'association' where appropriate.
- The data were self-reported and collected through a common questionnaire, which may introduce common-method and response biases. The reported Harman single-factor result should not be treated as a definitive test of the absence of common-method bias.
- The analysis controls for organizational size and industry sector, but the submitted manuscript does not provide detailed sampling distributions for these variables. Their coding and descriptive statistics should be retained in the final dataset and reported if required by the journal.

CONCLUSION

This study examined human–AI collaboration in digital marketing among businesses in Somalia. Respondents reported frequent use of AI for content creation, customer analytics, marketing automation, social media management, and decision support. The principal barriers were technical skills, infrastructure, implementation costs, data privacy, and organizational resistance to change. Human–AI collaboration was positively associated with customer engagement, marketing efficiency, and business growth in the reported correlation and regression analyses. These findings support the relevance of combining AI capabilities with human judgment and contextual expertise in emerging digital markets. However, the cross-sectional design and purposive sample mean that the results should be interpreted as associations rather than causal effects.

7. RECOMMENDATIONS

- Invest in practical AI and digital marketing skills for business owners, marketing professionals, and ICT personnel.
- Improve access to reliable and affordable digital infrastructure and AI-enabled tools, particularly for small and medium-sized businesses.
- Use AI to augment human judgment, creativity, and strategic decision-making rather than treating automation as a substitute for human oversight.
- Develop internal policies covering data privacy, transparency, human oversight, and responsible AI use in marketing.
- Strengthen collaboration among government, universities, technology providers, and businesses to support AI skills development and responsible digital innovation.

SUGGESTIONS FOR FUTURE RESEARCH

- Use larger probability-based samples to improve representativeness and generalizability.
- Conduct comparative studies across Somalia and other African emerging markets.
- Examine organizational culture, employee AI readiness, trust in AI, customer perceptions, and responsible-AI practices as additional explanatory variables.
- Where feasible, combine survey data with objective marketing indicators such as conversion rates, customer retention, campaign costs, or engagement metrics.

CONSENT FOR PUBLICATION

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CONFLICT OF INTEREST

The author confirms that this article's content has no conflict of interest.

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APPENDIX A. COMPLETE QUESTIONNAIRE AND SCORING PROCEDURE

Instructions to respondents. This questionnaire asks about the use of artificial intelligence (AI) in digital marketing within your organization. Please answer based on your actual experience. There are no right or wrong answers. Your responses are confidential and will be used for academic research.

Section A. Demographic and Organizational Information

Variable	Values
	Business owners
	Marketing managers
Professional role	
Digital marketing specialists	
ICT/technology officers	
Total	
	Male
Gender	
Female	
Total	
	18–25 years
	26–35 years
Age	
36–45 years	
46–55 years	
56 years and above	

Section B. AI Adoption in Digital Marketing

- Response scale: 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Frequently, 5 = Very frequently.
- Our organization uses AI-assisted tools to create or generate marketing content.
- Our organization uses AI tools for customer or market analytics.
- Our organization uses AI tools to automate marketing activities or campaigns.
- Our organization uses AI tools to manage or optimize social-media marketing.
- Our organization uses AI-supported tools to assist marketing decisions.

Scoring: AI Adoption Score = mean of Items B1–B5. Higher scores indicate more frequent reported use of AI-enabled marketing applications.

Section C. Human–AI Collaboration

Response scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

- AI tools complement rather than replace human expertise in our marketing activities.
- Marketing employees use AI-generated information together with their own professional judgment.
- Marketing employees review and interpret AI-generated outputs before important marketing decisions are made.

- Our organization combines AI capabilities with human creativity and contextual knowledge when developing marketing activities.
- Human staff retain responsibility and oversight when AI tools are used for marketing decisions.

Scoring: Human–AI Collaboration Score = mean of Items C1–C5. Higher scores indicate stronger integration of AI capabilities with human expertise. No items are reverse-coded.

Section D. Perceived Benefits of Human–AI Collaboration

Response scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

D1. Customer Engagement

- AI-supported marketing helps our organization respond to customers more quickly.
- AI-supported marketing enables more personalized customer interactions.
- AI-supported marketing helps us maintain more continuous customer engagement.
- AI-supported marketing improves the relevance of our communications to customers.

D2. Marketing Efficiency

- AI-supported marketing reduces the time required to perform routine marketing tasks.
- AI-supported marketing improves the productivity of our marketing team.
- AI-supported marketing improves campaign planning, execution, or optimization.
- AI-supported marketing enables faster analysis of marketing data.

D3. Business Growth

- AI-supported marketing helps our organization reach new or broader customer segments.
- AI-supported marketing helps improve customer acquisition.
- AI-supported marketing strengthens our competitive position.
- AI-supported marketing contributes to overall business growth.

Scoring: Customer Engagement Score = mean of D1 items 1–4; Marketing Efficiency Score = mean of D2 items 1–4; Business Growth Score = mean of D3 items 1–4. The three benefit constructs are kept separate in analysis.

Section E. Barriers to AI Adoption

Response scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

- Lack of technical and AI-related skills is a barrier to wider AI adoption in our organization.
- The cost of implementing AI tools is a barrier to wider adoption.
- Data privacy and security concerns are barriers to wider adoption.
- Limited digital and technological infrastructure is a barrier to wider adoption.
- Resistance to organizational change is a barrier to wider adoption.

Scoring: Barrier Score = mean of Items E1–E5. Higher scores indicate greater perceived barriers to AI adoption.