



Original Article

Artificial Intelligence, Workforce Development, and the Transformation of Marketing

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Abstract

Artificial intelligence (AI) is reshaping marketing through automation, predictive analytics, personalization, content generation and data-driven decision-making. At the same time, AI adoption is changing the knowledge and skills required of marketing professionals. This paper revisits the relationship between AI, workforce development and marketing transformation using a secondary-data statistical approach. The analysis is grounded in the source material provided for this study and supplemented with recent published statistics from the OECD and World Economic Forum (WEF). OECD data show that the share of firms reporting AI use increased from 8.7% in 2023 to 14.2% in 2024 and 20.2% in 2025. This represents an increase of 11.5 percentage points and a relative increase of approximately 132.2% over the two-year period. AI adoption is also strongly associated with firm size: 52.0% of large firms used AI in 2025 compared with 17.4% of small firms. Sectoral differences are substantial, with 57.3% of ICT firms and 36.8% of professional and scientific-service firms reporting AI use. WEF evidence indicates that 39% of workers' core skills are expected to change by 2030 and that 59 out of every 100 workers are likely to require training. The paper argues that marketing transformation should therefore be treated not simply as a technology-adoption programme but as an integrated workforce-development and governance challenge. The findings support investment in AI literacy, data literacy, analytical and creative skills, lifelong learning, responsible AI governance and industry-education collaboration.

Keywords: Artificial Intelligence, Workforce Development, Digital Marketing, Generative AI, Marketing Transformation, AI Adoption, Skills, Statistical Analysis

Introduction

Artificial Intelligence refers to computational systems capable of performing activities associated with intelligent behaviour, including learning, reasoning, adaptation and automation. The source paper positions AI, Workforce Development (WD) and Marketing Transformation (MT) as an interconnected trio. Workforce development involves planned efforts that enable employees and other stakeholders to acquire the knowledge, skills, credentials and attitudes needed for current and future roles, while marketing transformation describes the movement from traditional marketing towards digitally enabled, data-intensive and increasingly automated practices.

The marketing function has already undergone several waves of technological change. The spread of the internet, personal computing, mobile devices and social media created new channels and altered consumer behaviour. Contemporary AI extends this transformation by supporting customer segmentation, personalization, content creation, campaign optimization, attribution and decision support. Generative AI further expands the capability set by producing text, images and other forms of content from prompts.

The central issue is therefore no longer whether marketing will be affected by AI, but how organizations can capture its benefits while preparing workers for changing roles and addressing privacy, fairness, transparency and accountability. The statistical evidence presented below provides a measurable basis for assessing the scale and direction of this transition.

Objectives of the Study

- To examine recent statistical trends in organizational AI adoption.

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- To assess differences in AI adoption by firm size and industry.
- To examine the implications of AI adoption for workforce skills and training requirements.
- To analyse how AI is transforming major marketing functions.
- To identify strategic, ethical and policy implications for AI-enabled marketing and workforce development.

Research Questions

1. How rapidly has AI adoption among firms increased in recent years?
2. Do large firms adopt AI at substantially higher rates than small firms?
3. Which sectors show relatively high AI adoption?
4. What scale of workforce skill transformation is expected by 2030?
5. What workforce-development and governance measures are required for effective AI-enabled marketing?

Research Methodology

This study uses a descriptive secondary-data research design. The conceptual framework and thematic structure are derived from the supplied research paper, which identifies AI capabilities, marketing functions, workforce development, ethical issues, measurement and governance as major dimensions of transformation. Statistical evidence is drawn from recent OECD and World Economic Forum publications. No primary survey responses are invented or treated as original field data in this paper. The analysis uses frequencies, percentages, percentage-point changes and relative growth calculations. Where an indicator is reported for multiple years, the change is calculated as: $\text{Relative Change (\%)} = \frac{[\text{Latest value} - \text{Initial value}]}{\text{Initial value}} \times 100$. The study is therefore statistical and evidence-based, but it should be interpreted as secondary-data analysis rather than a causal econometric study.

Statistical Analysis of AI Adoption

OECD data indicate a strong upward trend in firm-level AI adoption. Across OECD countries with available data, 20.2% of firms reported using AI in 2025, compared with 14.2% in 2024 and 8.7% in 2023.

Year	Firms using AI (%)	Change (percentage points)	Relative change from 2023
2023	8.7	—	—
2024	14.2	+5.5	+63.2%
2025	20.2	+6.0	+132.2%

Table 1. Trend in firm-level AI adoption. Source: OECD (2026), ICT Access and Usage data.

The increase from 8.7% to 20.2% represents an 11.5-percentage-point rise in two years. In relative terms, the reported share is approximately 2.32 times the 2023 level. This indicates rapid diffusion, although the majority of firms still did not report AI use in 2025.

1. AI Adoption by Firm Size

Firm size is an important differentiator. OECD evidence reports AI use among 52.0% of large firms in 2025, compared with 17.4% of small firms. The difference is 34.6 percentage points, while the large-firm adoption rate is approximately three times the small-firm rate.

Firm category	AI adoption (%)	Gap vs. small firms
Small firms	17.4	0.0 pp
Large firms	52.0	+34.6 pp

Table 2. AI adoption by firm size. Source: OECD (2026).

2. AI Adoption by Industry

Sectoral differences are also substantial. ICT firms recorded the highest reported adoption at 57.3%, followed by professional and scientific services at 36.8%. The gap between these two sectors is 20.5 percentage points.

Industry	AI adoption (%)
ICT	57.3
Professional and scientific services	36.8

Table 3. Selected industry-level AI adoption rates, 2025. Source: OECD (2026).

Workforce Development and Skills Transformation

AI adoption changes the task composition of marketing work and increases demand for hybrid capabilities. The supplied paper identifies data literacy, AI literacy, governance awareness, ethical judgement, strategic thinking, analytical capability and creative problem-solving as important areas for workforce development.

The WEF Future of Jobs Report 2025 provides a broader quantitative context. Employers surveyed globally expect 39% of workers' core skills to change by 2030. The same report estimates that 59 out of every 100 workers will require training by 2030. AI and big data are identified among the fastest-growing skills, alongside technological literacy, creative thinking, resilience, flexibility, agility, curiosity and lifelong learning.

Workforce indicator	Reported statistic	Interpretation
Core skills expected to change by 2030	39%	Large-scale skills transformation
Workers needing training by 2030	59 per 100	Strong need for upskilling/reskilling
Jobs created by 2030	170 million	Expansion of new work opportunities
Jobs displaced by 2030	92 million	Significant task/job disruption
Net employment change	+78 million	Creation exceeds displacement in aggregate

Table 4. Selected workforce statistics. Source: World Economic Forum, Future of Jobs Report 2025.

AI and the Transformation of Marketing Functions

The statistical evidence demonstrates the scale of technological diffusion, while the supplied conceptual framework explains where the transformation occurs within marketing. Five functional areas are particularly important.

1. Customer Insights and Segmentation

AI can process large volumes of customer and market data to identify patterns, segments and behavioural signals. This supports more granular market intelligence and can shorten the time between data collection and managerial decision-making.

2. Personalization and Customer Experience

AI enables organizations to tailor communication, recommendations and customer interactions across multiple channels. The movement from isolated campaigns towards integrated customer journeys makes personalization increasingly central to marketing.

3. Content Creation and Campaign Optimization

Generative AI can assist with text, visual concepts and other content formats, while predictive systems can support campaign testing and optimization. Human review remains important because brand consistency, factual accuracy, copyright, bias and reputational risk cannot be delegated entirely to automated systems.

4. Channel Strategy and Attribution

The expansion of digital channels creates complex attribution problems. AI can support cross-channel analysis and optimization, but organizations need robust measurement frameworks to distinguish correlation from causal impact.

5. Marketing Decision-Making

AI increasingly functions as a decision-support technology rather than merely an automation tool. Marketing managers therefore need sufficient AI and data literacy to interpret model outputs, question assumptions and connect automated recommendations to business objectives.

Statistical Interpretation and Key Findings

The combined evidence supports five major findings. First, AI adoption is accelerating: the OECD reported an increase from 8.7% of firms in 2023 to 20.2% in 2025. Second, adoption is uneven, with a 34.6-percentage-point difference between large and small firms. Third, knowledge-intensive and technology-intensive sectors show particularly high adoption. Fourth, the workforce implications are substantial because 39% of core skills are expected to change by 2030. Fifth, training is becoming a strategic requirement rather than an optional employee benefit, with 59% of workers represented in the WEF scenario requiring training by 2030.

Indicator	Initial	Latest	Absolute change	Relative change
Firm AI adoption	8.7% (2023)	20.2% (2025)	+11.5 pp	+132.2%
Large vs. small firm adoption	17.4% small	52.0% large	+34.6 pp	≈199% higher
ICT vs. professional/scientific	36.8% prof./scientific	57.3% ICT	+20.5 pp	≈55.7% higher

Table 5. Comparative statistical interpretation. Calculations are based on published OECD figures.

Ethical, Legal and Social Considerations

Rapid adoption increases the importance of privacy, consent, transparency, fairness and accountability. AI-enabled marketing frequently depends on personal and behavioural data, creating a need for data minimization, appropriate consent mechanisms and clear governance. Algorithmic bias may influence segmentation, personalization and campaign decisions. Organizations should therefore combine technical controls with human oversight, documentation, monitoring and escalation procedures.

Measurement, ROI and Governance

AI marketing initiatives should be evaluated through measurable business and customer outcomes. Relevant measures include conversion rate, customer acquisition cost, retention, engagement, customer lifetime value, campaign efficiency, content production time and return on investment. Total cost of ownership should also include data preparation, infrastructure, model/API costs, employee training, cybersecurity, compliance and human review.

Governance should be proportionate to organizational scale and decision risk. A practical framework includes defined responsibilities, model documentation, data governance, bias testing, human-in-the-loop review, periodic audits and clear escalation procedures.

Strategic Implications for Organizations

- Build organization-wide AI and data literacy rather than limiting AI capability to technical teams.
- Prioritize continuous upskilling and reskilling for marketing professionals.
- Develop hybrid roles combining marketing knowledge, analytics, AI tools and ethical judgement.

- Start AI projects with measurable business objectives and defined performance indicators.
- Use human oversight for high-impact customer, pricing, targeting and reputational decisions.
- Strengthen data governance, privacy controls, transparency and accountability.
- Create partnerships among universities, industry, technology providers and government for workforce development.

Policy Implications

The evidence suggests that workforce policy should move beyond general digital literacy towards practical AI capability. Universities and professional institutions can introduce modules in AI-assisted marketing, data analytics, prompt and workflow design, digital ethics, privacy and AI governance. Industry partnerships can provide applied projects, internships and micro-credentials. Public-private funding mechanisms can reduce the training gap faced by smaller firms.

Limitations of the Study

This paper is based on secondary statistics and therefore does not estimate a causal relationship between AI adoption and marketing performance. The OECD indicators refer to firms and sectors across countries with available data, while WEF figures represent employer expectations rather than observed future outcomes. The statistics should consequently be interpreted as evidence of direction, scale and expectations rather than as proof that AI alone causes specific employment or marketing outcomes.

Conclusion

Artificial intelligence is accelerating the transformation of marketing while simultaneously changing the capabilities required of the marketing workforce. The statistical evidence provides a clear indication of the scale of change: OECD firm-level AI adoption increased from 8.7% in 2023 to 20.2% in 2025, while adoption reached 52.0% among large firms and 57.3% in ICT. At the workforce level, WEF estimates that 39% of core skills will change by 2030 and that 59 out of every 100 workers will need training.

The central implication is that successful AI adoption cannot be separated from workforce development. Organizations that invest only in technology may struggle to realize value if employees lack the skills to interpret data, manage AI systems, evaluate outputs and apply ethical judgement. A sustainable marketing transformation therefore requires a combined strategy of technology adoption, skills development, measurement and responsible governance. Future empirical research should test these relationships using organization-level survey data, regression models and longitudinal measures of marketing performance.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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