

The Strategic Implication of Artificial Intelligence on Freelancing in Bangladesh: A Review of Literature

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Keywords:

AI; Bangladesh; Freelancing; Job market; Strategic Implication

Abstract

This study critically analyzes the strategic impact of Artificial Intelligence on freelancing in Bangladesh. Using a systematic literature review, data was gathered from scientific articles available on platforms such as Google Scholar, SSRN, Wiley database, as well as reports from PricewaterhouseCoopers International Limited (PwC). The findings highlight strategic implications using a Strengths, Weaknesses, Opportunities, and Threats (SWOT) framework. AI presents a potential threat to freelancers, as some job roles can now be replaced by AI technology. The authors also highlight that the current lack of AI-related skills is a weakness but could also be seen as an opportunity for upskilling. This underscores the importance of enhancing skills to manage and optimize AI systems effectively. Additionally, AI has created opportunities in expanding AI-related job sectors in Bangladesh, supported by global AI trends, increasing government recognition of freelancing, new job creation, and improved productivity. Among these factors, AI acceptance, government recognition, and productivity enhancements can be considered strengths. The practical implications suggest that freelancers and policymakers alike can leverage these strategic insights to enhance the Bangladeshi freelancing sector. This study's further emphasize potentials for AI skills development, aiding the growth of freelancing careers. While existing studies tend to focus on AI's benefits and risks, few explore the strategic implications within the Bangladeshi freelancing context. Academics, policymakers, freelancers, and other stakeholders invested in advancing digital Bangladesh should engage in further research on developmental pathways for upskilling and supporting freelancing as a robust sector.

1. Introduction

Artificial Intelligence (AI) nowadays is one of the most uttered terms all over the world. It is the result of sophisticated technological development. In the modern world, people's lifestyle is integrated with technology, thus AI has become an inevitable factor in almost all sectors. So, there have been thousands of researches conducted, and many more in progress. As a new phenomenon, AI-related researches are discovering various aspects of AI, and it is essential to integrate it

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with relevant fields and factors. This study has the intention to find out the strategic implications created by AI on the freelancing sectors of Bangladesh.

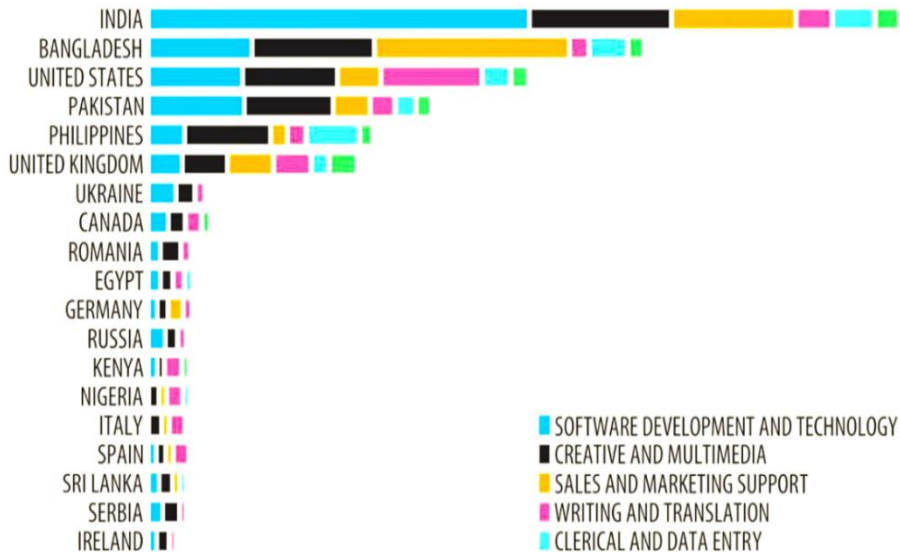


Figure 1: Global Freelancing ranking (Bhuiyan *et al.*, 2023)

Artificial intelligence has significantly advanced due to the development of machine learning across various fields, including government, business, and society (Soni *et al.*, 2020). The father of AI, McCarthy (2006), defined AI as “the science and engineering of making intelligent machines, especially intelligent computer programs.” In other words, AI refers to machines simulating human intelligence processes, particularly through computer systems. Examples of AI applications include expert systems, natural language processing, speech recognition, and machine vision (Krassadaki & Matsatsinis, 2023). The internet connects over 5.6 billion people worldwide, or about 64% of the global population, integrating AI deeply into modern life (Statista, 2023). However, the vast publicity around AI can make it difficult for those outside the field to fully understand it (Kaplan & Haenlein, 2020). According to Nissim & Simon (2021), AI significantly impacts the freelance job sector.

Freelancing has become a highly popular profession in Bangladesh (Figure 1), ranking second globally in IT-based freelancing jobs, just after India, according to a recent report by the Oxford Internet Institute (Bhuiyan *et al.*, 2023).

2. Literature Review

2.1 Recent Trends in AI

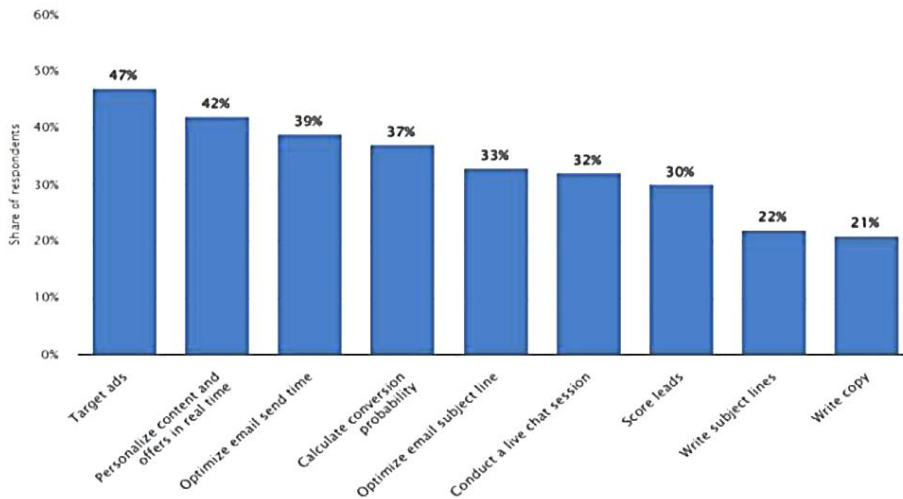


Figure 2: AI use in various tasks (Hadalgekar, 2023)

Litman et al. (2021) identify five primary areas where AI has developed rapidly: natural language processing, speech recognition and generation, image and video generation, multi-agent systems, and robotics' vision and motor control. According to Hadalgekar (2023), AI's applications vary widely (Figure 2), with targeted ads being one of the top uses. Companies employ AI to reach highly potential customers by processing vast customer data for optimized targeting. The second most common use of AI is in content personalization (Meta, 2024). A notable AI application is the development of chatbots.

Chatbots are intelligent systems created using rule-based or self-learning (AI) techniques. They have existed since 1950 when Alan Turing raised the question, "Can machines think?" Since then, various technologies have aimed to pass the "Turing Test," such as ELIZA (1966), ALICE (1995), and, more recently, Apple Siri, Amazon Alexa, and Microsoft Cortana (Xu et al., 2021). Human trainers enhance these models' performance by supervising and ranking responses, which then fine-tune the model through Proximal Policy Optimization (PPO) iterations (Taecharunroj, 2023).

The recent release of AI-based chatbots like ChatGPT has sparked curiosity among millions (Taecharunroj, 2023). Chat Generative Pre-Trained Transformer (ChatGPT), an OpenAI chatbot, debuted in November 2022 and quickly gained

popularity, amassing over a million users within a week (Broussard, 2014). Built on OpenAI's GPT-3 language models, it was fine-tuned using supervised and reinforcement learning methods. ChatGPT is a significant addition to the family of "chatbots". As a prototype, it quickly gained attention for its comprehensive answers and articulate responses across many fields. It can respond conversationally to questions, write essays, generate code, offer travel or gift suggestions, explain complex topics, and even compose poetry. Its responses are drawn from vast amounts of internet data, which lends it significant expertise in areas it has been trained extensively on.

While ChatGPT cannot replace humans entirely, its creativity and seemingly authoritative responses make it notable. However, a key drawback is its inconsistent factual accuracy and potential to propagate fake information and misrepresentation. These issues raise ethical and legal concerns related to copyright, privacy, and consent (Taecharungroj, 2023). According to Gupta et al., (2023), following ChatGPT's release, OpenAI was valued at \$29 billion. OpenAI, a San Francisco-based research firm, is headed by Sam Altman and backed by Microsoft, LinkedIn co-founder Reid Hoffman, and Khosla Ventures (Taecharungroj, 2023).

2.2 Freelancing and AI in Bangladesh

The adoption of Fourth Industrial Revolution (FIR) technologies is being accelerated by globalization in Bangladesh. AI is beginning to demonstrate its potential in advancing the economy under the framework of Industry 4.0 (Iqbal *et al.*, 2021).

A study by the Oxford Internet Institute (OII) indicates that Bangladesh is the second-largest supplier in the online labor market, with around one million freelancers—650,000 of whom are from the IT sector (Hasib 2024). Currently, 47% of Bangladesh's population has internet access, with popular AI-driven platforms such as YouTube, Google, and Facebook commonly used (Prothom Alo 2024).

Automation and control technologies are now utilized in a range of industries, and the terms AI, IoT, Big Data, and Blockchain have only recently gained traction in Bangladesh. Although the development of AI technology has been underway for some time, its effects are just now becoming evident in the country. Several sectors, including services, transportation, education, agriculture, healthcare, and environmental management, are considered prime for AI integration. Increasingly, AI technology is being woven into everyday life through apps for ride-sharing, natural language processing (NLP) for Bengali, customer service chatbots, booking systems, weather forecasting, real-time mapping, and more (Babu, 2021).

Currently, 37% of companies and organizations in Bangladesh use AI, but less than 15% of major firms actively employ AI skills, despite nine out of ten having invested in AI technology. The rise of AI is projected to eliminate 85

million jobs while creating 97 million new positions by 2025 (Benbya *et al.*, 2020). The global Information Technology (IT) sector has been expanding since the onset of FIR. Bangladesh's IT sector, while still small relative to other GDP-contributing industries, is seeing increased export growth. Over 4,500 software and IT companies are registered in Bangladesh (Dev *et al.*, 2023).

According to a 2020 International Labor Organization (ILO) report, more than half of the Bangladeshi population participates in the labor force, with nearly two-thirds aged 14 to 64. A 2020 a2i analysis projects that the IT industry will create at least 10,000 new jobs annually (Dev *et al.*, 2023). Additionally, Bangladesh has around 7 million English speakers, who can access IT skills through universities, training centers, and on-the-job training, especially with government support. Many IT-based roles, such as in contact centers and e-commerce, require basic computer knowledge and a solid command of English. In response to the COVID-19 pandemic, several companies invested in digitizing services, leading to further industry growth.

2.3 AI Impact on Industries:

AI is already influencing a wide range of activities, from our online searches to shopping experiences (Soni *et al.*, 2020). According to Statista (2024), AI is widely applied in life sciences, automotive, professional business and services, finance, retail, communication, technology, media and entertainment, consumer goods, supply chain and logistics, healthcare, manufacturing, architecture-engineering-construction, government, travel and hospitality, and non-profit sectors (Figure 3).

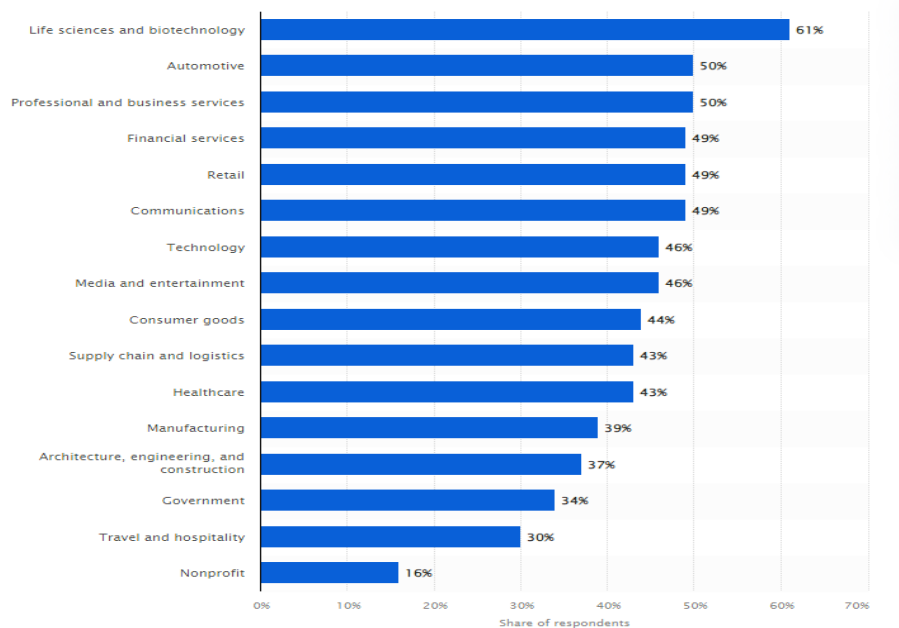


Figure 3: AI Usage in Service Organizations by Industry (Statista, 2022)

PricewaterhouseCoopers (PwC) research (Hawksworth *et al.*, 2018) suggests that up to one-third of jobs could be at risk of automation by the mid-2030s, with workers with lower educational levels being most vulnerable. This has spurred concerns that AI advancements could make human labor redundant in various sectors (Sun, 2018). Portrayals of AI in popular media have heightened fears of job displacement, as many tasks once performed by humans are now automated. Recent mass layoffs in major tech companies like Microsoft, Amazon, and Twitter—totaling over 70,000 workers—have been partly attributed to AI-driven restructuring (Tschang & Almirall, 2021). Unfortunately, efforts to re-skill affected employees have been minimal. Moreover, academic curricula often remain misaligned with industry needs, producing IT graduates lacking necessary skills for relevant positions.

% OF EXISTING JOBS AT POTENTIAL RISK OF AUTOMATION

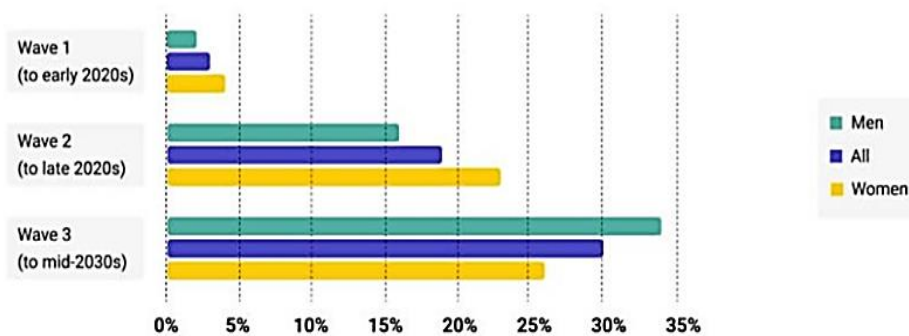


Figure 4: Percentage of Existing Jobs at potential risk of Automation (Hawksworth *et al.* 2018)

PwC reports (Hawksworth *et al.*, 2018) indicate that by the mid-2030s, up to 35% of jobs could be automated, potentially displacing millions globally. Freelancers in fields like data entry, coding, software development, graphic design, and content creation—where tasks can be handled by AI tools such as ChatGPT—face particular risks (Nissim & Simon, 2021). Shamim Hossain, a software engineer at Datasoft, observes that while ChatGPT can generate scripts across programming languages based on internet-based code, it lacks the capability to resolve unique challenges (Karmaker, 2022). Thus, programmers are still essential for translating concepts into solutions that meet customer needs. According to Mehedi Kabir, an AI researcher at the Berlin Institute of Technology, “Technology should be viewed as a tool, not a replacement for people” (Karmaker, 2022).

2.4 Government Recognition and Changes in the Job Market

More than 5,000 freelancers have contributed to creativity and entrepreneurship, boosting government tax revenue compared to traditional models (Jiang & Duan, 2021). However, revenue growth remains below expectations. A recent study estimates that robotization could displace up to 800 million skilled workers worldwide by 2030 (Stakanov & Ukhova, 2020). Some industry experts predict that robots could replace 40% of current jobs within the next 15 years (Susskind *et al.*, 2015). The impact of AI on specific job roles is challenging to forecast, though certain tasks—like customer service, bookkeeping, data entry, and market research—are particularly susceptible to automation (Autor, 2022).

2.5 Reskilling and Upskilling Freelancers

AI, a disruptive force blending algorithms, data, and computing power, is advancing rapidly (Duch-Brown *et al.*, 2022). Additionally, online platforms, including search engines, social media, and e-commerce, are transforming multiple digital markets, enhancing societal efficiency. In a study, 65% of respondents felt that freelancers are better prepared than others to handle AI advancements, as they constantly upskill (Duch-Brown *et al.*, 2022). AI's rise globally implies freelancers can't avoid its impact. To remain competitive, Bangladeshi freelancers must enhance their skills in AI utilization (Hasib 2024).

2.6 Emerging Job Opportunities

According to the World Economic Forum (WEF), advancements in AI and robotics will yield a net increase in jobs over the next five years (Browne, 2020). The WEF forecasts 97 million new jobs, a net gain of 12 million. This shift will require companies to invest heavily in reskilling and upskilling to prepare employees for future workplaces. Positions like data analysts, AI specialists, digital marketing strategists, business developers, software engineers, and IoT experts are expected to grow in demand (Browne, 2020).

2.7 Productivity Boost in Freelancing

The Online Labor Index reports a 65% growth in online labor over the past four years, with AI gaining significant global economic importance (Duch-Brown *et al.*, 2022). The growth in online labor markets aligns with AI advancements and R&D investments, creating new freelancing opportunities (Duch-Brown *et al.*, 2022).

To succeed, freelancers need excellent communication skills to clarify requirements diplomatically. AI tools, like 'ChatGPT' and 'Respondable,' analyze emails to help freelancers interact positively with clients (Diamantoulakis *et al.*, 2015). For time management, 'Futurenda' enables freelancers to organize tasks efficiently (Diamantoulakis *et al.*, 2015). Tools like 'Logo pony' support graphic designers by providing customizable design options (Kim & Lim, 2019). Additionally, digital marketing tools like 'Crystal.io' simplify data analysis, allowing marketers to focus on creativity.

AI's facial recognition technology is now used to authenticate freelancers' identities, while tools for intelligent dispatch and risk analysis provide a competitive edge, enhancing productivity and career prospects (Venkatesh, 2021).

3. Methodology

This study is designed as a systematic literature review, sourcing relevant literature from scientific journals and articles available on Google Scholar, SSRN, Wiley databases, and PwC reports. The primary focus is to explore the strategic implications of Artificial Intelligence (AI) on freelancing jobs in Bangladesh, particularly examining its effects on areas such as job displacement, revenue impact, skill evolution, emerging job opportunities, and enhanced workflow efficiency. The research scope is thus confined to the strategic implications of AI on freelancing jobs within the context of Bangladesh. This paper aims to provide a clear understanding of the opportunities and threats AI presents to the freelance sector in Bangladesh.

AI, especially tools like ChatGPT, has become a prominent topic of interest globally, with its search popularity on Google increasing by 1600% over the past year. On Google Scholar alone, 'ChatGPT' yields around 1990 results, including academic articles. The authors have narrowed this search to examine AI's impact in Bangladesh, using keywords such as “artificial intelligence,” “Bangladesh,” and “freelancers.” Table 1 presents the search results related to AI.

Table 1: Article Search Results

Database	Keywords			
	ChatGPT	Artificial Intelligence	Freelancing	Bangladesh
Google Scholar (2019-recent)	6,580 Articles	5,420,000Articles	93,800 Articles	2,900,000 Articles
SSRN	223 papers	7,349 papers	99 papers	4,624 papers
Wiley	3 results	287 results	27 results	7 results

Upon review, the authors found a lack of research focused specifically on the recent growth and commercialization of AI in the Bangladeshi freelancing sector. This indicates an urgent need to assess the potential impact of AI on Bangladesh's freelance market, especially in terms of job security, revenue implications, new roles, and workflow enhancements. From an initial pool of 468 articles, a manual screening was conducted to identify relevant content that addressed the Bangladeshi context. Only a few articles met this criterion, selected based on subjective relevance to the topic. Additionally, credible sources like PwC reports (Hawksworth *et al.*, 2018) were consulted through online search engines for further insights.

4. Discussion

2.1 Recent trends in AI infers that Artificial intelligence has evolved, enabling businesses to leverage it for commercial benefits, such as through chatbots. ChatGPT, for instance, allows companies to produce comprehensive, articulate responses across a range of fields, affecting jobs traditionally performed by humans. The recent wave of layoffs in major IT firms hints at AI's impact on employment. AI assists in tasks like targeted advertising, content design, email optimization, live chat, lead scoring, and subject line writing. The most common AI applications include Targeting Advertisement (47%), Personalized Content (42%), and Email Optimization (39%). Strategically implies that AI is well accepted in both conceptual and technical areas of work. Freelancers with AI skills are well accepted in both areas of work.

According to 2.2 Freelancing and AI in Bangladesh, AI is a key component of the Fourth Industrial Revolution. As the world's second-largest supplier of online labor, with around one million freelancers, Bangladesh has significant potential to harness AI across various sectors, including services, transportation, education, agriculture, health, and environmental management. Strategically implies that, In the future, the freelancers who will be working in services, transportation, education, agriculture, health, and the environment in Bangladesh need the skills of AI.

As per 2.3 AI Impact on Major Industries, the authors find that specific industries actively adopting AI, such as Life Sciences and Biotechnology, Automotive, Business, Finance, Retail, Communication, Technology, Media, Consumer Goods, Supply Chain and Logistics, Healthcare, Manufacturing, Government, and Non-profit sectors. The most affected industries include Life Sciences and Biotechnology (61%), the Automotive industry (50%), and Business Services (50%). It is anticipated that by the 2030s, over one-third (35%) of all sectors will integrate AI through automation, potentially resulting in job displacement. This implies that freelancers must prepare to engage with AI across these sectors to secure future opportunities.

From 2.4 Government Recognition and Changes in the Job Market, the authors determine that freelancers contribute more tax revenue compared to traditional employment models. Yet, AI is gradually replacing roles that previously required human labor, creating a shift in job structures. With around 40% of occupations anticipated to be replaced by robots and AI, freelancers associated with such roles may face uncertainties. This implicates a growing need for governmental recognition and regulation of freelancing, especially in the context of AI-driven transformations in the job market.

Conferring to 2.5 Reskill or Upskill Freelancers, AI-intensive IT sectors now require a skilled workforce. A global push for AI skills in freelancing has emerged, yet opportunities to reskill or upskill freelancers are minimal in Bangladesh. If freelancers are equipped with AI skills, it could become a key

strength in their careers; without these skills, however, they may face limitations in an increasingly AI-driven market.

Analyzing 2.6 Emerging Job Opportunities, the authors find that AI and technological advancements are expected to create 12 million new jobs, especially in fields like data analysis, AI and machine learning, digital marketing, business development, software and app development, and the Internet of Things. This signifies ample job prospects for freelancers skilled in AI across these emerging areas, which may offer more sustainable career pathways.

Finally, based on 2.7 Productivity Boost in Freelancing it can be inferred that, Due to AI advancements, freelancing has expanded, with the online labor market growing by 65% over the last four years. AI now assists freelancers in client communication, time management, graphics design, data processing, and various digital marketing tasks. Additionally, AI helps manage freelancer identity authentication, intelligent task assignment, and risk identification in financial processes. These AI capabilities provide freelancers with a competitive edge, increasing both productivity and potential client reach. The strategic implication is that AI could enable freelancers to complete tasks faster and with higher quality, further enhancing productivity.

Table 2: AI Strategic Implications

AI Relevant Factors		Strategic Implication
AI acceptance	AI is well-accepted in both conceptual and technical areas of work.	Strength
AI-relevant sectors in Bangladesh	In the future, freelancers who will be working in services, transportation, education, agriculture, health, and the environment in Bangladesh need the skills of AI	Opportunity
Global Industry trend	In the future 35% of all industries will be connected with AI.	Opportunity
Government recognition	The government will highly recognize freelancing	Strength and opportunity
Human replacement	Occupations will be replaced by robots and AI	Threat
New Skill	If the freelancers can be reskilled or upskilled, it can turn into a major strength in their job; otherwise, it will work as a weakness.	Opportunity/Weakness
New Job creation	Job opportunities will increase for those freelancers who have AI skills in specific fields	Opportunity
Increase Productivity	The versatility and efficiency of AI utilization will increase the productivity of Freelancers.	Strength and Opportunity

Conceptual Framework

Figure 5 is a conceptual framework developed based on these AI strategic factors relating to Freelancing in Bangladesh (Data from Table 2)

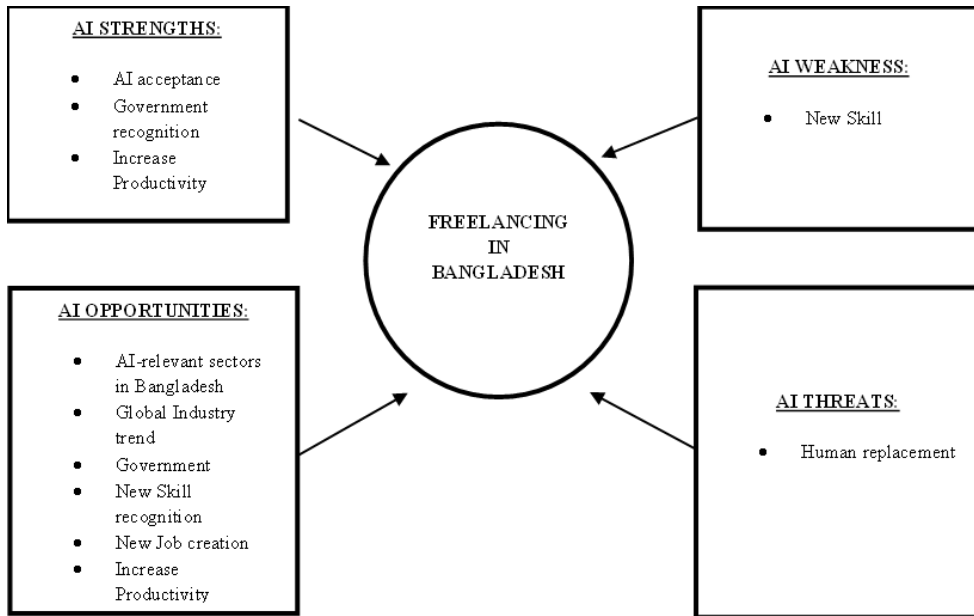


Figure 5: Conceptual framework

5. Conclusion

This review highlights the significant strategic impact of AI on Bangladesh's freelance industry. Although AI poses certain threats, such as job displacement, its influence also brings considerable opportunities, including improved productivity and the emergence of new roles. As some tasks are automated, freelancers need to acquire relevant skills to stay competitive. The paper underscores the importance of upskilling for freelancers, which may transform AI from a threat into a key resource. AI is driving growth in AI-related job sectors in Bangladesh, alongside greater potential for government support and improved productivity in freelancing. Strengthening skills and fostering AI adoption within freelancing can thus help Bangladesh progress in the Fourth Industrial Revolution, aiding both economic and digital growth. This calls for further research to guide freelancers, policymakers, and stakeholders toward constructive developments in Bangladesh's freelance sector.

Author's contribution

Assistant Professor Kamal Hossain initially generated the idea, then it was modified a little by Assistant Professor Kazi Md Fahim Ahmed through incorporating the 'Strategic implications' part. Assistant Professor Kazi Md Fahim Ahmed crafted the abstract, while data collection was carried out by both Assistant Professors Kamal Hossain and Kazi Md Fahim Ahmed, along with Research Assistant Sabrina Hossain Fariha. Assistant Professor Kamal Hossain conducted the literature review, and the research methodology was jointly developed by Assistant Professors Kazi Md Fahim Ahmed and Kamal Hossain. The discussion

and conceptual framework were primarily the responsibility of Assistant Professor Kazi Md Fahim Ahmed. Research Assistant Sabrina Hossain Fariha conducted the formatting and graphics task, while Mr. Firoz Akanda, Lecturer in the Department of English and Modern Languages at IUBAT, provided proofreading services independently and voluntarily.

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Conflict of Interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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