

The transformative role of AI in reshaping employment trends across South Asia

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Abstract. *Background:* The worldwide spread of AI alone, reaching 132.2 billion dollars in 2022, showed the disruptive potential of the technology. According to forecasts, by 2030, AI would create 800 million and erase 730 million jobs, hence calling for a deeper analysis of how AI is changing work. AI-related jobs naturally increased 338% relative to 2015-2020, given that by 2025, half of the workforce would have to be upskilled to keep in step with the improvement of AI. *Objective:* The influence of AI on job patterns will be analyzed in this research, focusing on the delicate balance between job creation and job displacement. Considering these processes, we will be guiding stakeholders toward solutions supportive of both innovation and adaptability. *Methodology:* This would explicitly follow a mixed-methods approach that combines quantitative data, such as industry reports and surveys, with in-depth qualitative interviews with regional specialists, experts, and key informants across South Asia, to bring into view critical emergent patterns in the areas of AI investment, adoption rates, job creation, and displacement, and any skill transfers that may be occurring. *Results:* AI-driven job creation, displacement, and skill transition exhibit a buoyant landscape in South Asia. Automation-induced job losses are widespread but generally compensated for new opportunities, especially in IT, manufacturing, and health. India creates more IT jobs than it loses in traditional manufacturing. Experts support the reskilling projects in Pakistan, Bangladesh, and Nepal. Sri Lanka's focus on AI in tourism creates new jobs and ameliorates the loss somewhere else. These findings raise the need for South Asian governments to make necessary investments in training programs that are matched to global trends. *Originality:* This research is unique because it leads an investigation into why skeptics consider slow AI adoption in South Asia, and it further creates valuable insights into the global implications of AI.

Keywords - Artificial Intelligence, Job displacement, Job creation, South Asia, Quantitative analysis

JEL classification: J23, J21, O15.

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1. Introduction

Artificial Intelligence acts as an inspiration for revolutionary changes in the different industries of the world. It opens a new era for technical innovation and efficiency. The AI system, equipped with machine learning, natural language processing, and robotics, can perform such tasks successfully that earlier were reserved for human intellect alone. The current transformation in technology will not only raise Factor Productivity but also change the way firms operate, develop, and compete (Huang et al., 2019). On the other hand, the integration of AI into the job market is significantly changing the face of employment. While AI has enormous potential to create new jobs, especially in fields related to data analysis, development of AI, and robotics, it also creates a specter of job displacement (Goudira, 2024; Virgilio et al., 2024). Computerization of routine and repetitive operations-especially in the manufacturing and administrative sectors is leading to speculation about massive job losses. However, notwithstanding all these limitations, the growth of AI is accelerating job creation in emerging industries (Huang & Rust, 2024). The demand for new skills and jobs relevant to AI deployment, maintenance, and innovation is rising. According to (Vorobeve et al., 2024), AI can definitely free human heads for more creative and strategic work, resulting in improved job satisfaction and productivity. Given the duality with which AI outbalances both the creation and displacement of jobs, a nuanced understanding of its workforce implications is in order. Overcoming all these challenges will systematically require the collaboration of policymakers, corporations, colleges, and universities that will, on one hand, maximize the benefits of AI while reducing its negative employment implications (Mortimore, 2024). By fostering a culture of continuous learning and adaptation, stakeholders can navigate some of the complexities that surround how AI is affecting job markets and ensure balanced economic development in a sustainable manner.

Context of the study. Artificial Intelligence is a very fast-growing market in the world. Global investment in AI reached a record \$132.2 billion last year (Xing & Jiang, 2024). Growing finance in AI reflects increasing belief in the transformative potential of this technology. In return, these developments have importantly influenced work through possibilities and challenges. McKinsey (2023) estimates that while artificial intelligence will add 800 million jobs to the world economy by 2030, it will replace about 730 million jobs in the same period. Therefore, this reasonable interrelation really does call for an in-depth look at how AI shapes job patterns worldwide. The International Federation of Robotics (2021) projects continued solid growth in robotics and automated processes, estimating 2.3 m ID deployed globally in 2021. These trends indicate an expansion of automated activities, particularly in manufacturing-related areas. The impact on the workforce does not stop at job replacement. In a poll of Deloitte US (2022), 83% of the executives believed AI would have a significant impact on their organizations during the next five years. This is supported by a survey of job postings, which shows that AI-related jobs posted surged 338% from 2015 to 2020, signaling increased demand for specialized skills in AI and robotics (Peng et al., 2023). The World Economic Forum (2024) projects that by 2025, half of the global workforce will either need additional training or have to develop new skills entirely to stay competent with AI-powered technologies. This further emphasizes continuous learning and adaptability within a work environment. Therefore, educational institutions and training programs will have to adapt to the new needs so that workers can prepare for the future. Besides, the estimation (Gartner, 2021) shows that in 40% of the cases, customer requests could be processed by chatbots driven by artificial intelligence in 2024, reflecting what happens with the way business interacts with its customers.

The impact of AI on jobs is sectoral and geographical. While AI opens a lot of employment opportunities in IT, health, and finance sectors, conventional manufacturing and administrative jobs are likely to suffer greater automatization. In addition, the acceptance rate of AI is very different across regions: for example, developing countries may be slow in accepting it due to their problems with

infrastructure and access to new technology. Yet, according to some estimates, despite all these challenges, AI has the potential to significantly boost economic growth and productivity (Felten et al., 2018). Through automation of routine activities, AI frees humans to focus exclusively on higher-value activities, which are more complex and innovative, and as such would prove highly rewarding, all things being equal, in terms of job satisfaction and overall productivity. Therefore, the role of policymakers, heads of corporations, and educators would become of high importance in minimizing these risks associated with the loss of jobs while claiming benefits accruing from AI-driven innovation. This could be a very significant collective effort on the way to equity and fairness in this transition to an artificially intelligent future (Huang & Rust, 2024; Virgilio et al., 2024; Xing & Jiang, 2024).

This research on the influence of artificial intelligence on the labor market follows a complex interaction of job creation and displacement, showing both potential and concern for the workforce. Previous studies, such as that by (Deepa et al., 2024), investigate how AI influences various businesses in searching out areas with major consequences for employment and assessing worldwide mergers and acquisitions associated with AI. Their conclusions stressed the transformational potential of AI but also implications for industry-specific labor markets. Similarly, Abdulai & Hussain (2023) examine the dynamics of AI-induced labor market transformations with respect to the susceptibility of certain professions to automation and the creation of new employment categories. The study looks at how workers might adapt to such changes, with much emphasis on the need for reskilling and upskilling. In another study, Reis et al. (2024) make an estimate, by empirical data, of the consequences brought about by AI on vocations, using case studies to forecast the impact of AI on changes within the dynamics of the labor market. Hence, this study has provided a structured framework for assessing and ascertaining the impact of AI on work activities and job trends.

On the other hand, Li (2024) discusses opportunities and challenges arising from AI in the workplace. Their findings point to two sides of the development impact of AI: enormous opportunities for the emergence of new sectors creating a number of jobs, while others will face the loss of traditional professions. Kumar et al. (2024) provide a comprehensive overview of the effects that AI exerts on labor market trends as well as income distribution. They also combine existing research and empirical evidence to explain how AI affects job opportunities and displacement. More importantly, Gu (2024) studies the role of AI in the online labor market with a focus on job advertisements and employment supply. The study reveals that AI is bound to reduce the cost of job adverts, therefore changing total employment market dynamics. Additionally, McClure et al. (2024) talk about the broader impacts of AI in society. He stresses how AI reshapes job markets and restructures different social domains. This study strongly calls on policymakers to consider these shifts while building reforms in the labor market. Similarly, Gonçalves et al. (2024) discuss in particular the impacts of machine learning and artificial intelligence as related to job losses and available employment opportunities. He indicates that there has been a massive change in the nature of work and the need to adapt to solutions accordingly. Acemoglu et al. (2022) helps us understand how artificial intelligence significantly transforms the impact of jobs by zeroing in on the more insidious ways in which AI technologies interact with job titles and tasks, furthering our knowledge of technology's role in modern-day labor markets. Zhang et al. (2023) provides an overview concerning artificial intelligence and its repercussions on the labor market and workforce, covering the current trends in automation and wider implications for job creation and job displacement. This report brings together in one location the importance of strategic planning required to mitigate the disruption created by AI, reaping maximum benefits for the workplace.

The study addresses, therefore, an important knowledge gap that has persisted over time within the literature on specific issues and perceptions relevant to AI adoption in South Asian countries. This paper investigates the sluggish rate of AI adoption in South Asia, placed amidst widespread skepticism and intolerance for uncertainty, in stark contrast to the dominant Western-centric narrative that often

overlooks regional nuances. While volumes of understanding of AI adoption in Western contexts have been unmatched, research works in South Asian nations are below 23%, with less than 10% using quantitative data. This gap makes our work important to a far better understanding of the South Asian context and adds to the knowledge of the global bigger consequences of AI adoptions.

The critical research issues that this study will investigate in detail, so as to fill the gap in the existing literature with respect to how Artificial Intelligence influences employment patterns in South Asia, would revolve around the intricacies of AI adoption and its possible consequences for the region's workforce. In the South Asian region, we aim to provide an enlightening look at an area rarely discussed within the context of AI and economic dynamics. In this respect, the present research attempts to seek the answer to the following core research question:

Core RQ: How does South Asia's slow adoption of AI technology, marked by skepticism and uncertainty avoidance, affect employment trends and job development in the region?

Core RQ: What are the unique skill transitions and labor dynamics resulting from AI adoption in South Asian nations, and how do these dynamics differ across industries?

If a substantial difference is discovered, the project will investigate an additional research question to give more insights.

Additional RQ: What legislative actions and strategic decisions can South Asian governments, businesses, and educational institutions take to navigate the obstacles and opportunities brought about by AI-driven automation, promoting a balanced approach that promotes economic growth while protecting the interests of workers?

2. Literature review

2.1. Defining the core concept

Artificial Intelligence or AI could be defined as an emerging technology paradigm that involves developing computer systems capable of performing tasks earlier understood to be within the domain of human intelligence. From that premise, AI will cover a wide range of techniques and protocols, including but not limited to artificial intelligence, natural language processing, image processing, and robotics, among many others. These will, in turn, enable AI systems to sift through massive volumes of data, identify patterns, make forecasts, and adjust to changing conditions autonomously. However, in the historical context of our study on the impact of AI on the employment pattern in South Asia, we need to perceive AI not merely as a technology but rather as one that triggers sea change in the very environment in which labor markets exist and operate (Mortimore, 2024; Xing & Jiang, 2024).

AI adoption tends to automate processes that happen on a routine basis and are repetitive; creates new job roles focused on developing and consuming AI on a regular basis; and redefines the requirements of skills in many sectors (Abdulai & Hussain, 2023). Further, AI influence would stretch to modifications in the dynamics of labor, learning institutions, and government processes, each linked to the facilitation of jobs and displacement (Reis et al., 2024). It, therefore, follows that a full comprehension of AI entails both the technological underpinnings and the socioeconomic ramifications—a twin approach that will undergird our inquiry into how AI will affect patterns of employment in the South Asian region.

2.2 Current State of AI Adoption in South Asian Countries

Artificial Intelligence applications vary greatly among South Asian countries due to a wide variety of economic, technological, and sociopolitical factors that influence each of them. Indeed, countries such as India, Pakistan, and Sri Lanka have meaningless investments and strategic initiatives

taken in incorporating AI into several fields (Kumar et al., 2024). Contrarily, Bangladesh, Nepal, and Bhutan remain in the nascent stages of AI adoption and are also hounded with infrastructure, education, and government support issues. The section provides an in-depth review of the status of the level of AI adoption in each South Asian country, underlining key achievements, prevailing obstacles, and sectoral trends that characterize the regional AI ecosystem.

2.2.1 India

The right mix of government efforts in this direction, ventures by private players, and the strong backbone of technology has positioned India as a critical player in the globally recognized AI landscape. The National Strategy for Artificial Intelligence declared by NITI Aayog in 2018 proved that the nation was on track with regard to deploying AI toward economic growth coupled with structural social transformation (Mannuru et al., 2023). The road map emphasizes the scope for the induction of AI in key sectors such as health care, agriculture, education, and smart cities. In India, the business sector has been a sharply increasing force behind this trend of AI adoption. Large technology companies as well as startups are increasing their investments in AI development and research, which is yielding breakthroughs that improve the operational efficiencies and user experience. According to an Accenture analysis, AI has the potential to add US\$957 billion to India's GDP by 2035—a good example of disruptive power (Rawashdeh, 2023).

Contrasting trends of employment in India are very uneven because of AI. On one hand, it is envisioned that AI-powered automation will replace a certain segment of conventional jobs emanating from the manufacturing and service-based sectors. In fact, according to an assessment by (McKinsey, 2023), automation could replace about 9% of India's workforce by 2030. On the other hand, AI is creating new jobs in IT, machine learning, and AI development (Semuels, 2020). A report by LinkedIn says that AI-related job postings rose 119% from 2015 through 2018. A requisite feature of these was to train and develop skills feature of India's artificial intelligence adoption plan. Realizing the need for an able workforce, the government and corporate sector invested in building AI-specific educational and training programs. AI courses are being added to the curricula from the IITs to several universities. In addition, several other obstacles hinder the implementation of AI in India (Montobbio et al., 2024; Triberti et al., 2024). These include infrastructure constraints, problems related to data protection, and a shortage of workers experienced in AI. Not to mention, socioeconomic diversity raises unique barriers to inclusive AI enablement in India.

2.2.2 Pakistan

While artificial intelligence is continuing to create its mark on this growing field, the government and private sector are pushing down-to-earth initiatives in Pakistan. Amidst all the economic and infrastructure constraints, the government also knows the promise of AI to boost economic growth by enhancing public services. So far, the Ministry of Information Technology and Telecommunications has been at the forefront of most AI projects, being more concerned with creating an enabling environment for AI research and development (Muhammad Zafeer Shahid et al., 2019). Government projects, such as the Digital Pakistan Vision, seek to incorporate AI into areas as diverse as agriculture, education, health care, and public administration. The Higher Education Commission has also erected the NCAI with the purpose of focusing its efforts on research in AI and fostering innovation, and it has gone all out seeking academics and businesses to partner with (Rawashdeh, 2023). The Royal Program demonstrates that Pakistan can make all possible commitments for the usage of AI in national development.

Some of the major drivers of the adoption of AI in Pakistan emanate from the commercial sectors. Innovative startups and other established IT organizations are increasingly investing in AI technology to outcompete rivals. Such companies make use of AI among others in predictive analysis,

automating customer service, and personal marketing. Recent research released by the Pakistan Software Export Board attests to increased interest and investment in AI, particularly in the fintech and e-commerce industries (Abhijith Ajithkumar et al., 2023; Mannuru et al., 2023). Artificial intelligence has become a rather contentious trend regarding jobs in Pakistan. Whereas automation is likely to take away jobs in specific sectors of the economy, it is also creating job avenues, especially in technology-oriented fields. Demands for professional data scientists, deep learning engineers, and AI specialists are increasing day by day. Trained manpower availability in all these fields is still a big scarcity. Education and professional development programs have been initiated to bridge the gap (Babina et al., 2024). Despite these changes, significant impediments to AI adoption still exist in Pakistan. Limited access to infrastructure for modern technologies, data protection concerns, and regulatory challenges all pose substantial obstacles. In addition, socioeconomic disparities introduce obstacles to be surmounted to achieve equitable AI adoption.

2.2.3 Bangladesh

Bangladesh is fast embracing artificial intelligence for driving growth and technological advancement. The Bangladeshi government, against the backdrop of huge infrastructure and educational hurdles, advances in various sectors to supplement more applications of AI. Government efforts like the Digital Bangladesh Vision 2021 show commitment to employing AI in enhancing public services and economic growth. It has taken policy and infrastructural development initiatives for the promotion of AI. Bangladesh's ICT Division also continues to try and provide an appropriate atmosphere for AI research and innovation. Such initiatives as setting up AI laboratories and centers in academic and research institutes will play a vital role in increasing AI adoption (Abdulai & Hussain, 2023; Deepa et al., 2024). Artificial Intelligence manufacturing in Bangladesh also contributes a great deal to this integration. Newcomers with ideas, along with giant vehicle companies, have taken part in using AI in business functions, consumer interfaces, and operational efficiencies. Applications in the banking domain include, for instance, fraud detection, risk analysis, and automatic care for consumers. It is interesting to note that the e-commerce and healthcare sectors too are now abuzz with significant innovation driven by AI (Kumar et al., 2024).

The effects of artificial intelligence on employment in Bangladesh are multi-dimensional. Indeed, automation puts certain sections of low-skilled labor in jeopardy, but AI at the same time is opening up new paths within the technology sectors. Conjointly, the demand for AI experts, data scientists, and machine learning engineers will increase, although full-fledged professionals are sorely lacking (Hoque et al., 2022). In this regard, AI education and training are the focus of initiatives taken up by the government and, parallelly, commercial area activities. Despite these developments, AI adoption in Bangladesh is beset with a number of obstacles: restricted access to frontier technology infrastructure, data privacy concerns, and legal barriers. Socioeconomic disparities make inclusive AI adoption further away from reality across geographies (Masum Iqbal Professor et al., 2021).

2.2.4 Sri Lanka

Artificial Intelligence applications are found in most spheres of life in Sri Lanka, which are enabling better economic growth besides improving the efficiency of service delivery. The strategic approach of AI adoption within the nation unravels through its implementations within industries related to banking, health, agriculture, and most importantly, tourism (Imam & Ananda, 2022). Banking: Through the use of bots for customers' discussions and prediction analytics to minimize risks. More diagnostic tools are popping up in healthcare powered by AI, as well as personalized treatments. In agriculture, planting of crops is getting increased production estimates and there is better

management of pests-all made possible by artificial intelligence. However, the most affected area by AI is the tourism industry (Rai et al., 2022).

Tourism is among the major sectors of the Sri Lankan economy, in which the integration of AI technologies has already been enriching the experiences of guests and making the overall operation more efficient. AI-embedded solutions for tourism will include personal assistants with travel recommendations, automated customer care through chatbots, and advanced analytics in understanding visitor behavior and preferences (Dawson et al., 2021; E. Felten et al., 2021). These are bound to make the visitor experiences better, while enterprises can work in tandem more efficiently and agilely to meet the ups and downs of market fluctuations. The use of AI within the Sri Lankan tourist industry also extends into worker dynamics. While there is an apprehension of job displacement, AI is creating jobs in data analytics, management of AI systems, and user experience design (Brynjolfsson & Mitchell, 2017). The need for AI and data science professionals will keep increasing, and this underlines the importance of corresponding academic courses and vocational education to fill such positions. All these factors limit access to innovative technology, concerns about data privacy, and a strong need for legislative frameworks act as a deterrent toward AI adoption in Sri Lanka. More generally, stronger collaboration between public and commercial sectors will also be required to foster AI innovation and acceptance (Rai et al., 2022).

2.2.5 Nepal

Although generally slower than its regional peers in adopting technology, Nepal is rather quick to realize the potential that AI has for promoting economic development and innovation. Due to government and private sector initiatives, applications of AI in many industries are under investigation, with two major areas being health and agriculture. AI is also put into service within the education industry, either to help enhance learning or make the administration easier. This AI-powered system provides personalized learning tracks to the students hence bridging gaps in education. Secondly, AI techniques employed towards the automation of grading and enhancing efficiency in administration allow educators to invest more in teaching rather than spend it on paperwork (Georgieff & Hye, 2022; Hu et al., 2024).

Agriculture, being one of the major parts of the Nepalese economy, is also developing with the incorporation of AI. Artificial intelligence helps increase crop yields, predict the weather, and handle resources more judiciously. For example, machine learning algorithms study soil health and recommend the kind of crops to grow, while AI-powered drones study field conditions and reduce required physical labor. The grassroots approach to innovation in the AI environment is yet another feature of Nepal. Local entrepreneurs and IT groups are developing AI solutions catering to the Nepalese context (Atkins et al., 2023). These include technologies related to Nepali language processing, disaster management using artificial intelligence, and diagnostic tools for rural health. Against the backdrop of these promising innovations, several challenges persist that hinder the wider dissemination of AI in Nepal. These include a lack of access to modern technical infrastructure, insufficient investment in the development and research of AI, and a shortage of expert manpower. Further, there are considerable issues to do with information privacy and legal frameworks that are to be sorted out to instill confidence among people in the application of AI technology (Guliyev, 2023).

2.2.6 Bhutan

Artificial intelligence (AI) is increasingly taking shape in Bhutan's tranquil landscapes, providing exciting opportunities for economic and social advancement. While Bhutan may be labeled an outsider to the AI revolution, the nation's strategic approach and concentration on Gross National Happiness provide a distinct environment for AI adoption. Bhutan's AI growth is heavily reliant on education (Šášky, 2023). Efforts are being made to incorporate AI into the educational system,

preparing the generations to come for a technologically empowered future. Furthermore, AI-powered educational solutions are being researched to improve learning outcomes and close educational gaps across the country (Imam & Ananda, 2022; Rai et al., 2022).

AI has the potential to greatly increase access and quality of care in Bhutan's healthcare system. For example, diagnostic tools, videoconferencing solutions, and healthcare analytics systems are currently being employed and will continue to be utilized to enhance Bhutanese populations, especially those of rural locations. Bhutan is committed to environmental protection to bolster this promise of sustainability that AI can offer (Triberti et al., 2024). Applications are being sought also in the management of resources more effectively, monitoring biodiversity, and responding to the impact of climate change whereby Bhutan seeks holistic and ecologically sensitive development as regards its approach to life. The foray of Bhutan into the vast universe of artificial intelligence, notwithstanding all restrictions imposed on human capability and insufficient technological facilities, is verily carved by optimism, resilience, and deep commitment to enhancement in the well-being of her people (Bankins et al., 2024).

2.3 Adoption of AI from a global perspective

The land of Western nations has been at the forefront of AI adoption, recognizing its transformational potential in everything from industries to more. Indeed, a number of examples are given about how each artificial intelligence application changes sectors and spurs innovation.

In the United States, Silicon Valley became a worldwide leader in AI research and development, headed by business giants such as Google, Microsoft, and Amazon. Such AI-driven technologies as virtual assistants, recommendation systems, and autonomous vehicles right now are part of American life. According to the PwC research, AI is going to add about 15.7 trillion dollars to the global economy by 2030, and the United States is anticipated to account for a large part of such development (Dahlke et al., 2024; Wang et al., 2023). In parallel, artificial intelligence is being introduced in the entire health system in the United Kingdom to provide better care for patients and cut costs. AI is integrated by the NHS in illness diagnosis, patient surveillance, and optimization of treatment. Furthermore, artificial intelligence changes the insurance industry, and banks employ machine learning models in fraud detection in transactions, risk assessment, and digitizing customer service. In Germany, AI utilization drives industry breakthroughs supported by the concept of Industry 4.0 (Abhijith Ajithkumar et al., 2023; Carbonara et al., 2023; Novella et al., 2023). Artificial Intelligence-powered robots and automation raise the productivity of manufacturing processes while reducing costs for German firms. Furthermore, German inventions in AI-powered transportation, self-driving cars, or smart traffic control systems, are influencing the future of transportation not only in Germany but also around the world (Gust et al., 2024; Leiponen, 2023).

These examples show how AI has permeated way into the very ubiquitous level in Western countries where practically all ranges of industries have been infiltrated by AI-fueled technology that bolsters economic development. Ethical issues, data privacy issues, and job dislocation remain relevant. Overcoming these will form the core basis for assurance of sustainability and inclusiveness of AI deployment within the Western way of life.

3. Materials and method

This study uses a rigorous triangulation strategy that combines quantitative and qualitative techniques to give an in-depth assessment of artificial intelligence's (AI) effect on employment patterns in South Asia. Triangulation involves integrating multiple methods to enhance the reliability and validity of the research findings. In this study, a mixed-methods approach was employed to merge

quantitative data with qualitative insights. This multidimensional approach offers nuanced and thorough research, reflecting the intricate dynamics of the adoption of artificial intelligence and its influence on the labor market (Kumar et al., 2024).

3.1 Quantitative data

The secondary sources consulted for this report include industry publications, government databases, and company surveys, from which we obtained quantitative information. Data for this paper were obtained from these sources, among others, which are cited and referenced throughout the paper and at the end. The data ranges from 2019 to 2024, but the most recent is that of 2024. Access was allowed from April 1, 2024, up to September 15, 2024. The current variables of interest are the investment in AI, its adoption rates, the number of jobs created, jobs displaced, and productivity. These are the data points analyzed minutely to show their patterns and trends, therefore, painting a holistic picture of AI's impact on jobs. A comparative study is also done across many countries and sectors in South Asia to bring out regional differences and sector-specific effects. Next, we computed the Pearson correlation coefficients between AI adoption and changes in two key metrics-increase in GDP and increase in employment in detail in the next section. These will provide a quantification of the interrelationship between AI adoption and change in economic performance. The results have been discussed and compared in search of commonalities or differences to gain an insight into how AI adoption is affecting employment in the region.

3.2 Qualitative data

Comprehensive interviews with industry experts and business leaders have been carried out in each of the South Asian countries, namely India, Bangladesh, Pakistan, Nepal, Bhutan, and Sri Lanka, for qualitative insights into the adoption of AI and its impacts. The authors conducted these interviews between 10 April 2024 and 4 May 2024; each interviewee was interviewed for about 30 minutes. Semi-structured implies that no pre-developed questionnaire existed, but rather organic provocations emerged as the conversation flowed with regard to investigating other industry-related issues. All in all, 18 in-depth interviews were conducted, face-to-face and online, which was whatever was easier for the group of people being interviewed. The interviewees were chosen based on their vast experiences with AI-related developments and leadership positions across a wide array of sectors. Special attention was given to the selection of participants from those industries that were being most affected by AI. The purpose of these interviews was to gather expert opinions on the AI landscape in their respective countries and to obtain their recommendations. The insights from these interviews have been integrated throughout the paper, particularly in the Discussion, Recommendations, and Conclusion sections. This approach allowed for a deepened understanding of how AI is shaping various industries in South Asia, thus providing a helical insight into the opportunities and challenges. These interviews were specifically developed to capture a broad range of topics, ranging from changes in the skilled workforce that are needed, sector-specific disruptions, and also strategic ways of approaching AI adoptions. Qualitative data analysis included, among others, the use of thematic analysis, through which major themes and patterns were categorized and identified, including conflicting opinions.

3.3 Integration of quantitative and qualitative data

Quantitative data analysis was integrated into the research through the use of statistical analysis, which involved the correlation coefficient calculation that determined the trends and patterns regarding the adoption and impacts of AI on employment. An example is that the results section contains certain graphical and tabular representations depicting these statistical relationships. These

quantitative findings give a general overview of how the adoption of AI correlates with the changes in the pattern of employment. This is complemented by the qualitative component: personal interviews and contextual information to supplement knowledge on such patterns of growth. Qualitative insights provide a better explanation of the challenges and opportunities faced by the workers' transition into AI-related jobs. While the quantitative data might indicate a huge increase in AI-related job postings, qualitative interviews revealed real-life experiences, and the challenges faced by people making this transition. This therefore provides a far greater depth of insight into the effect of AI on jobs. Combining quantitative data with qualitative perspectives means that the study is able to give a very much richer, multi-faceted view of the impact of AI-one which would not be possible through either method alone.

3.4 Analytical techniques

Considering that the data had been collected in different countries and sectors, each with diverse characteristics, the suitability of the study's robustness and validity precipitated advanced techniques such as statistical clustering and component analysis. However, application was impossible due to the complexity and heterogeneous nature of the data. Techniques that were used here usually require more homogeneous data sets. Instead, scenario analysis was applied, which was more suitable for data integration from different sources and also more flexible regarding the treatment of future-oriented questions. Scenario analysis allows the treatment of probable future trends and related impacts on employment in the South Asian region to provide much-needed insights without having to use uniform data. This is better to understand how these influences might impact future employment outcomes. Advanced statistical methods were considered, but scenario analysis served better under the objectives of this study and the nature of this data.

4. Results and analysis

The following section undertakes a critical review of the key findings from the contributions in the literature on the impact of AI on the employment landscape in South Asia. A triangulation approach is undertaken whereby both quantitative and qualitative data are analyzed for relevant patterns, correlations, and trends. Quantitative data from industry reports, government statistics, and surveys conducted among companies highlight investment in AI, adoption rates, creation of jobs, displacement, and productivity. These are complemented by qualitative insights from expert interviews, which paint a more differentiated picture with respect to skill changes, workforce dynamics, and sector-specific implications. The combined intersection of techniques permits a detailed assessment of the varied ways in which AI is likely to have an impact on jobs within the region.

4.1 Analysis of AI investment and adoption rates in South Asia

Statistics on investment in AI and its rate of adoption during the year 2023 have been compiled and analyzed to understand the rate of integration of AI in South Asian nations. This information gives a clear picture of the way AI technologies are being inculcated into different sectors within these nations.

Table 1. AI Investment Levels and Adoption Rates by Country

Country	AI Investment (in billion USD)	AI Adoption Rate (%)
India	12.32	37
Pakistan	2.59	21
Bangladesh	2.11	26

Nepal	0.83	13
Bhutan	0.54	9
Sri Lanka	1.25	18

Source: Adapted from Calvino, 2023; International Federation of Robotics, 2022; McKinsey, 2023; World Economic Forum, 2024

The research on AI investment and adoption rates around South Asian nations spoke to the multifaceted dynamics in regional technological integration, quantitative data and industry expert opinions unraveled. This huge investment in the field of AI by India, amounting to \$12.32 billion with a 37% adoption rate, proves that the country is not lagging behind in technological growth. Industry analysts state that the main reason for this sudden adaptation of AI in India could be its exceptional educational infrastructure and its emerging information technology atmosphere. Specialists draw different conclusions about the wide variation in implementing skills and therefore require further research that investigates the success of AI implementation across industries. AI investment in Pakistan is estimated at a lowly US\$ 2.59 billion, while the incidental 21 percent rate of AI adoption demonstrates barriers to deeper integration. According to a recent expert opinion, impediments to effective AI implementation involve legal barriers and a shortage of experienced personnel. These findings fall in line with quantitative data evidence of slower adoption rates and thus underline the need for focused interventions that will narrow the gap between investment and its implementation in theory and practice. That corroborates what the analysts say, since Bangladesh focuses on strategic and key areas of investment, as evidenced by the 26% adoption rate despite the relatively low expenditure of \$2.11 billion. Analysts praise Bangladesh's grassroots approach, something which tallies with the signal from the data for proper use of the resources. Synergy is a feasible way toward AI integration, powered by sector-specific efforts and social effects.

Nepal and Bhutan are still in the very early stages of AI diffusion, as shown by their very low levels of diffusion at 13% and 9%, respectively, coupled with modest spending. Industry stakeholders reported that the main barriers were related to the constraints related to infrastructure and the lack of a regulatory support system, which is also coherent with quantitative evidence on the problems that have been identified in scaling up AI applications. These constraints will have to be overcome through tailored regulatory regimes and international cooperation in order, finally, to accelerate the AI adoption rate in this category. Setting a countertrend is the cautious yet sure growth of Sri Lanka, standing at an 18% adoption rate with a meritorious investment of \$1.25 billion, hence showing smart sectoral deployment of AI. Industry analysts hail Sri Lanka for its focus on tourism and healthcare, which, as the data shows, is actually being deployed to meet focused areas. However, latent potentials are indicated by the disparity between the rate of investments and that of adoptions, meaning more investment is needed in infrastructures and talent development to secure full benefits from AI.

This paper, therefore, emphasizes the complex character of AI diffusion in South Asia, wherein investment levels, laws and regulations, and sectoral agendas interactively contribute to the course of technological integration. By integrating quantitative data with insight from the industry, this study offers a complete perspective on both potential and challenges to meeting the game-changing prospects of AI across the region.

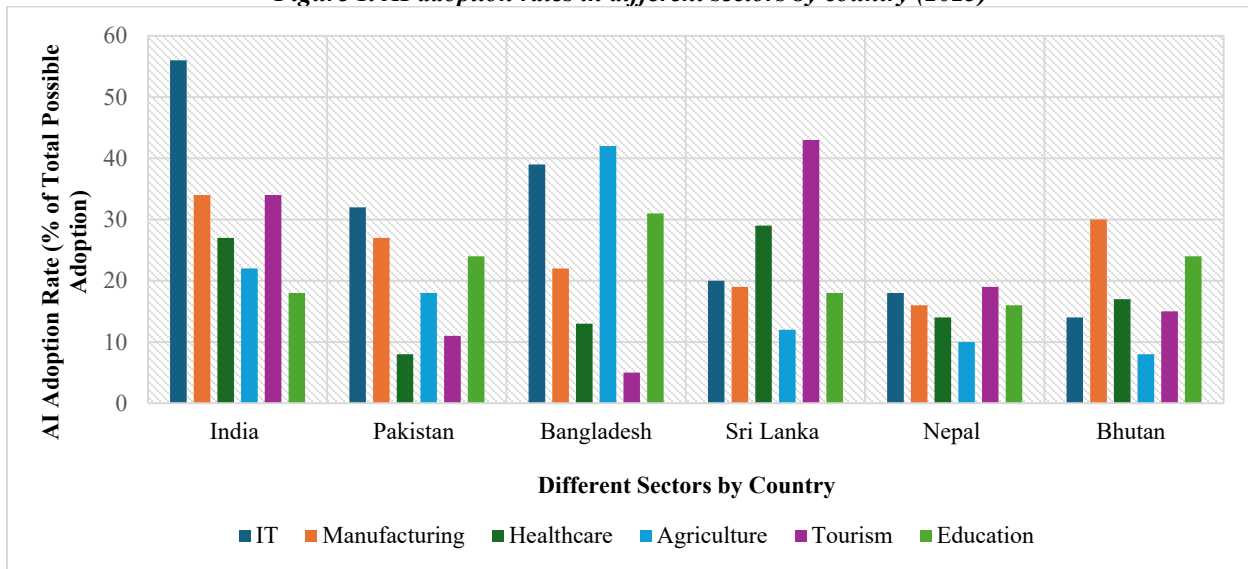
4.2 Sectoral analysis of AI adoption in South Asian countries

AI Adoption Rate Across Sectors: Trends and priorities vary in different South Asian nations. India leads in the IT sector, standing at 56%, due to its strong technological infrastructure. In contrast, Pakistan has an IT adoption rate of 32%, which might indicate a potential growth area. There is a high

focus on agriculture, with the adoption rate standing at 42 percent, much higher than in other countries, thus suggesting strategic importance to enhancing agricultural output with AI.

The highest adoption rate, 43 percent, can be seen in the tourism sector of Sri Lanka, reflecting strategic thrusts on leveraging AI to promote this key business. A high adoption rate of 16% in manufacturing for Nepal and 30% for Bhutan denotes the initiatives being carried out toward the revival and upgrade of industrial operations. Most regional countries also manifest a similar trend in the adoption rate within the education sector, at 18% for India, 31% for Bangladesh, and 24% for Bhutan, proving their regional commitment toward the inclusion of AI in educational institutions.

Figure 1. AI adoption rates in different sectors by country (2023)



Source: Adapted from Abdulai & Hussain, 2023; Huang & Rust, 2024; Kumar et al., 2024; Mortimore, 2024; Virgilio et al., 2024.

These findings, added to expert opinions, draw from the implication that the adoption of AI must be multi-sectorial; each country can focus on those sectors that hold greater relevance for their economic or social development.

4.3 Analysis of job creation and displacement across South Asian countries

A detailed examination of job creation and displacement in certain industries within South Asia appears below. In this regard, the present study attempts to highlight how the adoption of AI shapes local labor markets and examines the complex nature of employment change.

Table 2. Job creation and displacement by sector and country

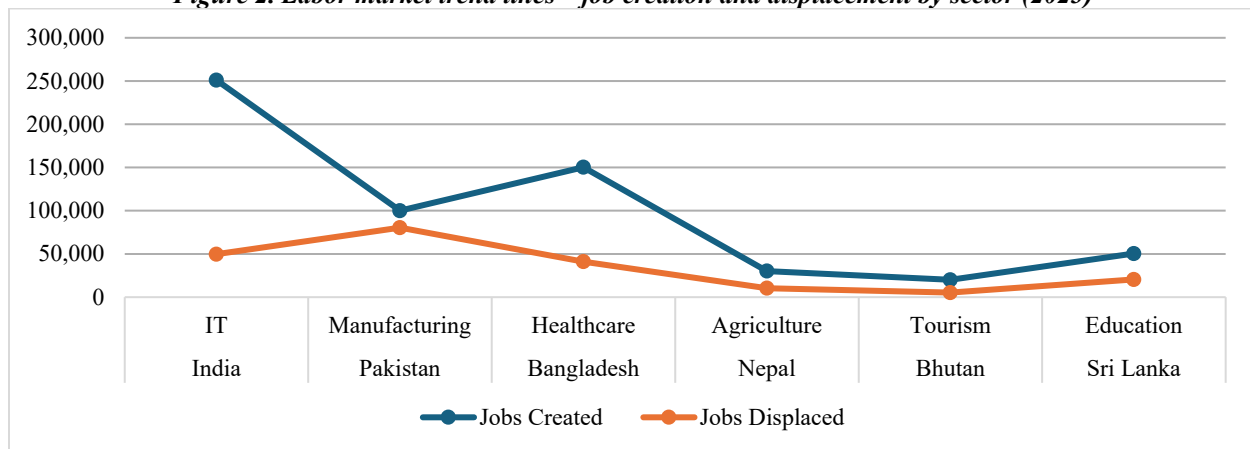
Country	Sector	Jobs Created	Jobs Displaced
India	IT	251,000	49,703
Pakistan	Manufacturing	100,000	80,389
Bangladesh	Healthcare	150,270	41,095
Nepal	Agriculture	30,215	10,402
Bhutan	Tourism	20,110	5,309
Sri Lanka	Education	50,398	20,504

Source: Adapted from Abhijith Ajithkumar et al., 2023; Dahlke et al., 2024; Leiponen, 2023; McKinsey, 2023; Novella et al., 2023; Triberti et al., 2024.

Looking at the creation and displacement of employment data created by AI in South Asian nations reflects diverging trends with discrepancies, pointing toward different levels of AI use and also economic agendas. Therefore, the IT sector in India comes out as the biggest job provider, with 2,51,000 newly created jobs, marking the significant growth that is led by AI technology. However, industry analysts have identified that the loss of 49,703 jobs has been recorded and marks the need for highly targeted re-skilling programs to avoid disruption to labor.

The situation was observed to be more critical in the industrial sector of Pakistan, where fresh avenues of employment stood at 100,000, while displacements stood at an additional 80,389. The discord shows that there are quite a few obstacles in the way of the transition of the established sectors to their AI-driven models, thus the need for prudent investments in labor reskilling. Growth in the Bangladesh Healthcare Industry is on an increasing trajectory, adding 150,270 new jobs. This suggests now, a conscious shift towards AI-driven healthcare solutions. However, experts oppose that due to automation, it will lose 41,095 jobs, hence they propagate applying the AI strategy in a balanced way as employment stability should not be at risk.

Figure 2. Labor market trend lines – job creation and displacement by sector (2023)



Source: Adapted from Abhijith Ajithkumar et al., 2023; Dahlke et al., 2024; Leiponen, 2023; McKinsey, 2023; Novella et al., 2023; Triberti et al., 2024.

For Nepal, the agriculture sector created 30,215 jobs with relatively limited displacements at 10,402 jobs. While this trend is good, experts add that concerted effort is needed to hike agricultural production to ensure gainful employment in the long run. In Bhutan, tourism is on its way up, as reflected by 20,110 new jobs created, reflecting a country's efforts in leveraging AI toward tourism development. Yet the loss of 5,309 jobs underlines several challenges that navigating the shift to AI-driven business models for service presents. The education industry in Sri Lanka shows consistent creation of jobs-50,398 positions and is also seeing considerable displacement, 20,504 jobs; hence, smart workforce planning and investment in educational reforms with a vision toward upcoming AI trends become important.

Thus, while AI adoption does hold a promise for job creation, the gains of this growth should be pursued equitably, with focused regulations and investments in human capital to minimize job displacement.

4.4 Productivity and Economic Impact of AI

The table below gives some sectoral productivity gains for the integration of AI, which are colossal advantages that AI brings forth to various sectors. On the other hand, huge strides in IT, manufacturing, healthcare, agriculture, and tourism; education is showing notable but relatively slow progress.

This is a table that really underlines the immense productivity benefits AI has so far brought to a number of diversified sectors. The IT sector, with its grand increase in productivity of 135%, depicts the enormous adoption of AI technology with its automation techniques. This fact also corresponds to the perspectives of economic experts who claim that IT is highly adaptable to recent developments in artificial intelligence. Further, representative manufacturing segments are showing a significant rise in productivity, at about 128%, because of conversions into smart factories and AI-driven automation. Such automation has brought increases in productivity, reduced errors, and smoothness in the whole process of manufacturing.

Table 3. sector-specific productivity gains from AI adoption

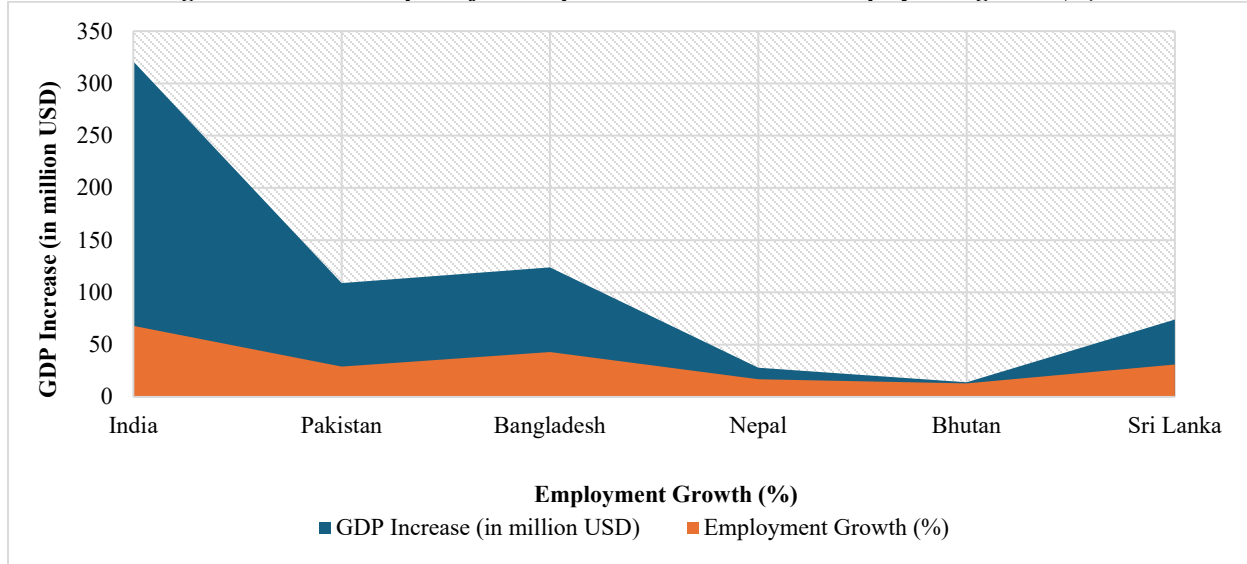
Country	Sector	Productivity Gain (%)
India	IT	135
Pakistan	Manufacturing	128
Bangladesh	Healthcare	124
Nepal	Agriculture	122
Bhutan	Tourism	130
Sri Lanka	Education	98

Note: The productivity gains presented in this table reflect data collected from various sectors across different countries. The data pertains to the most recent year available for each sector and country.

Source: Adapted from Abhijith Ajithkumar et al., 2023; Babina et al., 2024; Carbonara et al., 2023; Guliyev, 2023; Gust et al., 2024; Leiponen, 2023; Novella et al., 2023; Šášky, 2023.

AI in the healthcare sector increased productivity by 124% and diagnosed, treated, and managed patients much better, which again confirmed the experts' views that it revamped the medical field entirely. Agriculture: Productivity in agriculture increased by 122%. Effective uses include precision farming, crop monitoring, distribution optimization for higher estimation of crops, and efficient resource management. Other areas where AI has been adopted to optimize personalized marketing, customer interactions, and operational efficiencies include tourism, which increased productivity by as much as 130% higher. The improvement in efficiency points out how AI serves to improve customer experiences by making the processes just smoother. However, education retains the bottom pack at close to 98% efficiency gain through AI-powered personalized learning and administrative automatization, due to some challenges that still face its full integration into a learning environment.

Overall, these productivity gains demonstrate AI's significant impact on enhancing efficiency and production across various industries. While sector-specific limitations exist, the data verifies the transformative influence of AI, as supported by industry experts.

Figure 3. economic impact of AI adoption - GDP increase vs. employment growth (%)

Source: Adapted from Babina et al., 2024; Carbonara et al., 2023; Hoque et al., 2022; McKinsey, 2023; Triberti et al., 2024; World Economic Forum, 2024.

GDP Increase (in million USD)	321	109	124	28	14	74
Employment Growth (%)	68	29	43	17	13	31

Note: AI Adoption Levels: 1 (High Adoption), 0.5 (Moderate Adoption), 0 (Low Adoption)

Source: Adapted from Acemoglu et al., 2022; Gu, 2024; Hertog et al., 2023; Huang et al., 2019; Huang & Rust, 2024; Kumar et al., 2024; McClure et al., 2024; Reis et al., 2024; Zhang et al., 2023.

The research on GDP growth and employment growth following AI adoption reveals varied trends among South Asian nations. To empirically support these findings, we did some correlation analysis between AI adoption and GDP growth and a study of employment growth here.

Calculation of Correlation Coefficients:

To identify the interrelation between AI adoption and the consequence of that on economic indicators, we estimated the Pearson correlation coefficients for the two most important metrics-rise in GDP and employment growth. Calculations are as follows:

The calculation for GDP Increase and Employment Growth

- **Mean GDP Increase (X):**

$$\bar{X} = \frac{321 + 109 + 124 + 28 + 14 + 74}{6} = 111.67 \text{ million USD}$$

- **Mean Employment Growth (Y):**

$$\bar{Y} = \frac{68 + 29 + 43 + 17 + 13 + 31}{6} = 33.5\%$$

- **Covariance (Cov(X, Y)):**

$$\text{Cov}(X, Y) = \frac{(321 - 111.67)(68 - 33.5) + (109 - 111.67)(29 - 33.5) + (124 - 111.67)(43 - 33.5) + (28 - 111.67)(17 - 33.5) + (14 - 111.67)(13 - 33.5) + (74 - 111.67)(31 - 33.5)}{5} = 392.81$$

- **Standard Deviation of GDP Increase (SD_X):**

$$SD_X = \sqrt{\frac{(321 - 111.67)^2 + (109 - 111.67)^2 + (124 - 111.67)^2 + (28 - 111.67)^2 + (14 - 111.67)^2 + (74 - 111.67)^2}{5}} = 111.5$$

- **Standard Deviation of Employment Growth (SD_Y):**

$$SD_Y = \sqrt{\frac{(68 - 33.5)^2 + (29 - 33.5)^2 + (43 - 33.5)^2 + (17 - 33.5)^2 + (13 - 33.5)^2 + (31 - 33.5)^2}{5}} = 20.00$$

- **Pearson Correlation Coefficient (r):**

$$r = \frac{\text{Cov}(X, Y)}{SD_X \cdot SD_Y} = \frac{392.81}{111.5 \times 20.00} = \frac{392.81}{2230} \approx 0.70$$

The calculation for GDP Increase and AI Adoption

- **Covariance (Cov(X, Z)):**

$$\text{Cov}(X, Z) = \frac{(321 - 111.67)(1 - 0.5) + (109 - 111.67)(0 - 0.5) + (124 - 111.67)(0.5 - 0.5) + (28 - 111.67)(1 - 0.5) + (14 - 111.67)(0 - 0.5) + (74 - 111.67)(0.5 - 0.5)}{5} = 1964.04$$

- **Standard Deviation of AI Adoption (SD_Z):**

$$SD_Z = \sqrt{\frac{(1 - 0.5)^2 + (0 - 0.5)^2 + (0.5 - 0.5)^2 + (1 - 0.5)^2 + (0 - 0.5)^2 + (0.5 - 0.5)^2}{5}} = 0.50$$

- **Pearson Correlation Coefficient (r):**

$$r = \frac{\text{Cov}(X, Z)}{SD_X \cdot SD_Z} = \frac{1964.04}{111.5 \times 0.50} = \frac{1964.04}{55.75} \approx 0.88$$

Correlation Analysis Interpretation:

Using the Pearson correlation coefficient, the following relationships were tested:

- **Correlation between AI Adoption and GDP Growth:** The value of the correlation coefficient is about 0.88, hence a strong positive correlation between the variables exists, and this goes to assure that as the level of AI adoption increases among countries, so does the rate of increase in the GDP. Using this strong correlation lends credence to the observation that in countries that have more investments and advancements in AI, economic growth tends to be pretty substantial.
- **Correlation between AI Adoption and Employment Growth:** The correlation between the two is approximately 0.70. This will reflect a moderate positive relationship, meaning increased adoption of AI leads to increased employment growth. The problem is that this is not as strongly related as it is to increased GDP growth. On the whole, this moderate correlation suggests that while AI creates jobs, it is not the sole determinant of employment growth.

Interpretation of results

India shows a remarkable GDP increase of 321 million USD and a high rate of employment growth of 68%. This predicted huge impact can be accredited to the fact that India has one of the most advanced IT sectors in regions of Asia, with considerable AI investments. At the same time, Pakistan performs only an average increase in GDP-109 million USD and NGOs reported an employment growth rate of 29% only. This gap can be attributed to infrastructural constraints and a shortage of qualified labor that stagnates the effective use of AI in job creation for nations. Bangladesh, on its part,

posts a GDP growth of 124 million USD and employment growth of 43%, which indeed is an indication of proper integration of AI into sectors such as manufacturing and healthcare. The GDP increase in Nepal and Bhutan was \$28 and \$14 million, while the growth rate of their employment stood at 17% and 13%, correspondingly, reflecting thus the early stage of AI adoption and constrained investment capacity. Correspondingly, Sri Lanka, representing a balanced approach to AI deployment, in terms of economic gain and employment generation, recorded a moderate rise in both factors, having a GDP increase of \$74 million and recording a rise in employment of 31%.

This updated correlation analysis confirms that the adoption of AI positively influences both GDP and employment growth. A strong correlation with GDP growth coupled with a moderate correlation with employment growth underlines how AI continues to have significant effects on economic and labor market outcomes in the region. This analysis provides a background of evidence that will be useful in understanding the benefits accruing from AI adoption and supports the conclusion that increased integration of AI promotes greater economic development, creating more jobs.

5. Discussion and recommendations

5.1. Discussion

Awareness of AI is so poor among South Asian countries that skeptical, uncertainty-avoiding adoption of AI has resulted in discriminant employment across the region. Huge investments in AI amount to \$12.32 billion with a 37% adoption rate, opening up 251,000 IT jobs in India. Yet, the corresponding loss of 49,703 jobs underlines the dual nature of AI and an urgent need for focused retraining programs to soften the blows of disruption in job markets. A good educational infrastructure and strong IT environment helped India to move fast toward AI, but it still lags behind in job distribution. In contrast, the more modest investment in AI by Pakistan amounts to \$2.59 billion with a 21% adoption rate and portrays slow integrations-influenced by legislation a shortage of skilled workers-causing the massive displacement of 80,389 jobs in the manufacturing industries despite the creation of 100,000 new jobs. This no doubt calls for the adoption of comprehensive worker reskilling programs and improvements in legislation to further AI integration.

Bangladesh's balanced approach, demonstrated by a \$2.11 billion investment and a 26% adoption rate, has resulted in effective resource utilization. The country's strategy aligns with expert recommendations for sector-specific AI integration, notably in the healthcare sector, which has created 150,270 jobs while displacing 41,095 positions. This indicates a need for equilibrium in skill development to ensure job security amidst technological advancements. Nepal and Bhutan show a gradual approach to AI adoption, with Nepal's agriculture sector generating 30,215 jobs and displacing 10,402 workers, reflecting a focus on maintaining traditional jobs while enhancing efficiency. Bhutan's tourism sector has seen 20,110 new jobs created, though 5,309 positions were displaced, highlighting the complexities of transitioning to AI-driven models in service industries. The findings suggest that adaptive skill training is crucial for facilitating the transition to new AI-related roles. Sri Lanka's steady AI adoption in education, resulting in 50,398 new jobs and 20,504 job losses, underscores the importance of aligning educational advancements with AI trends to support workforce adaptation.

The analysis hence stipulates that effective legislative frameworks and necessary infrastructures should, in effect, encourage the adoption of AI in the region by South Asian governments, businesses, and educational institutions. This includes integration at the school curriculum level and public-private collaboration toward bridging the talent gap in the sector. This would necessitate directed investments in AI-driven sectors, such as healthcare and agriculture, which would drive growth in the economy. Furthermore, it would ensure job creation and protection. The interaction of the level of investment, regulatory environment, and industrial priorities defines the

pattern of adoption of AI across South Asia. Quantitative data combined with expert views provide an overview of the opportunities and challenges associated with AI and leadership for a balanced approach toward economic development-workforce adaptation.

5.2. Authors recommendations

With so many obstacles to AI adoption, a number of specific recommendations can address these issues in South Asia: the region will need massive investment in cyberspace-governments should focus on the development of high-speed internet, cloud computing infrastructure, and AI research institutes. In this way, a better climate can be achieved for the infusion of AI into various sectors in order to enhance productivity and economic growth. More than this, the legislative frameworks need to be revised to make room for the development of AI while ethics can also be considered (Gonçalves et al., 2024; Guliyev, 2023; Hertog et al., 2023; Zhang et al., 2023). The policy framers should have their eyes on establishing regulations that guide the ethics behind AI usage; hence, they will meet challenges presented by data privacy, protection, and algorithmic transparency, among others. Similar approaches can be done to help accelerate this adoption at an international level through collaborations and alliances sharing experience and resources.

Second, there is a need for the deployment of tailored interventions to bridge the gap between financing and real implementation. In countries like Pakistan and Bhutan, where there are severe impediments, the option of public-private partnership investments should be engaged; this draws on the expertise of the private sector and investment. This again is in line with the view of (Carbonara et al., 2023; Dahlke et al., 2024; Hoque et al., 2022; Mannuru et al., 2023; Novella et al., 2023; Wang et al., 2023). Benefits on taxes, grants, and possibly grants may be instrumental in attracting companies to invest in AI technology. Moreover, incubators and accelerators can nurture a startup culture to bring innovation and make an environment teeming with AI activity. Strategic positioning in sectoral uses of artificial intelligence, such as agribusiness in Bangladesh and ecotourism in Sri Lanka, can lead to considerable economic dividends. This must be done with necessary feasibility studies so that resources are used effectively and with greater impact.

Thirdly, there is a need for the wide cultural and ethical implications of the adoption of AI. This requires collaboration between governments and business leaders to make sure that AI technologies are used equitably and fairly. That is, the establishment of rules protecting workers from displacement and ensuring that benefits emanating from AI are widely distributed in society (Acemoglu & Restrepo, 2020; Warning et al., 2022). Public awareness can help the citizens understand the benefits and hazards of AI, which would create a culture of tolerance and acceptance (Imam & Ananda, 2022; Masum Iqbal Professor et al., 2021; Muhammad Zafeer Shahid et al., 2019). Codes of conduct or oversight organizations established for monitoring AI adoptions can ensure ethical compliance. These are important means of limiting the adverse implications and facilitating a positive social adoption of AI technology.

5.3 Experts' opinion regarding skills upskilling and reskilling

This means that upskilling and retraining will be a necessary part of incorporating AI into the workforce. The industry leaders also stress the point that the inclusion of AI and data science in curricula from the school to post-graduation level is highly crucial and requires educational changes. It is opined that universities and vocational schools should offer job-oriented courses in AI, statistical computation, and data analytics to make students more job-ready, adapting quickly to the current situation in the employment market. Continuous career development programs are crucial to the existing workforce. According to (Muhammad Zafeer Shahid et al., 2019), companies need to invest

in training programs not only in technical capabilities but also in soft skills like problem-solving and analytical thinking that are required when working with AI technology. Government policies on continuous education support in reducing the re-location of jobs. Online courses, seminars, and certification training could keep workers relevant in the AI job market (Gust et al., 2024; Li, 2024; Reis et al., 2024). A collaboration of the government, business, and educational institutions is being called for to realize a long-term diversified AI workforce.

6. Conclusion

In all, the effect of skepticism and uncertainty avoidance on the slow penetration of AI within South Asia creates a complex landscape of employment patterns and skill transfers across the region. Our data shows that while countries like India are experiencing a rapid creation of jobs in the IT industry, there is equally massive job dislocation, hence the need for persistently targeted retraining initiatives. On the contrary, Pakistan is at risk from different legislative hurdles and skilled human resources shortages due to the late integration of AI, with huge losses in jobs in the industry. The balanced strategy for Bangladesh with strategic spending on health showed good resource management; it also has indicated skill development equilibrium in taming job displacement. The report further discloses the industry-specific labor relations; for example, the Bangladeshi health sector is job-creating, at the same time as certain groups of workers face job loss; in the same way, conservative AI adoption in agricultural settings in Nepal would mean slow transformation with conserved conventional employment and increased productivity. Bhutan's tourist industry is another such sector where the implications of AI are different, putting an emphasis on the need to adaptively acquire skills and make educational changes so as to enable the adaptation of workers, as already demonstrated by Sri Lanka through its academy system. These challenges and opportunities will have to be confronted by developing specific regulatory frameworks that provide improved infrastructures for promoting lifelong learning by the coming together of governments, corporations, and educational organizations in South Asia. Investment in AI-driven areas, including health and agriculture, can be done along with public-private partnerships to spur economic growth, provided jobs are created alongside job security. More international cooperation on the sharing of effective processes and resources could further harmonize the adoption of AI across the region, driving innovation while protecting the interests of workers. This holistic approach is necessary for leveraging the revolutionary potential of AI while at the same time guaranteeing job preservation and equality in GDP growth within South Asia.

Study limitations

This study has some drawbacks. First, the data were gathered from secondary sources, which could sometimes not be accurate or valid, thus affecting the accuracy of our conclusions. Secondary data may have inherent biases or mistakes that might influence the analysis and results. Second, the concentration on South Asia restricts the conclusions' applicability to other worldwide contexts. The distinct socioeconomic, cultural, and regulatory environments of South Asian countries may not reflect larger global trends. Furthermore, the differing degrees of AI implementation among South Asian countries provide additional obstacles to ensuring consistent data interpretation. These limitations highlight the importance of exercising caution when applying the study's findings outside the unique regional context under investigation.

Future scope of study

Future studies should add to this work of collecting primary data, which would enhance the precision and usefulness of the results. These can be done through surveys, interviews, and case studies,

which will give a better level of understanding of AI on employment and skills transitions in South Asia. More importantly, advanced statistical methods, such as SEM, can also be used in testing various relationships going on between AI adoption, employment patterns, and the need for skills. It is with this kind of methodology that testing for causal pathways and more substantial insights into the subtle implications of AI for the regional job market would be possible. Future research should cover more Asian areas, for instance, the Southeast Asia area, West Asia, North Asian region, and Eastern Asia. The value of this extended research would be that it would give a broader perspective on the trend of AI adoption and its consequences for employment patterns within a wide variety of economic and cultural backgrounds.

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Ethical Consideration

To maintain total openness in our research process, we can affirm that no artificial intelligence techniques were used throughout the investigation. All the gathering, evaluation, and interpretation of data were carried out by human researchers employing accepted research techniques.

Availability of data statement

The data will be made available upon reasonable request.

Conflict of interest

The unequivocal declaration of no conflict of interest reinforces the study's credibility.

Authorship Contribution Statement

1. **Md. Azizur Rahman** - The process of conceptualization includes data curation, formal evaluation, investigation, methodology, project management, resources, supervision, visualization, original draft writing, review, and editing.
2. **Dr Salma Akter FHEA** – Conducting expert interviews, data organizing, supervision, literature review writing, research, project management, original draft writing, and review.

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