



FROM TASK AUTOMATION TO JOB TRANSFORMATION: HOW ARTIFICIAL INTELLIGENCE IS RESHAPING PRODUCTIVITY, SKILLS, WAGES, AND JOB SECURITY IN PAKISTAN'S IT LABOUR MARKET

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Abstract

Companies all over the world are transforming the way they work with artificial intelligence. Routine tasks are becoming automated, and decisions are being aided by machines, creating demand for new types of skills. The study explores the impact of AI on the future of work, specifically for information technology professionals in the workplace in Islamabad and Rawalpindi, Pakistan. Twenty IT professionals were interviewed, and their experiences and concerns were discussed. Work-related open-ended questions addressed five main topics: productivity, changes in jobs, roles, skills and training needs, pay and compensation, and job security. The encouraging part is that some things we found out are encouraging, and the other parts are, too. Most respondents feel that AI has improved their productivity at work, automates repetitive tasks such as coding, or improves the quality of their work output. Data processing frees people from more tedious and boring tasks to engage in more interesting and creative work. However, AI is transforming the nature of work. Programming, testing, and maintenance are regular activities; documentation is being automated. But individuals require new abilities: knowing how to use AI, interacting with data, crafting more effective AI prompts and queries, and keeping their skills up to date. In the economic domain, it is expected that AI will enhance the disparity between highly skilled and routine workers. Individuals with AI skills will likely be better compensated, whereas those who are not will likely be left behind. There could be pressure on wages for repetitive work. Importantly, workers do not expect a sudden wave of layoffs. However, they are concerned about less entry-level employment and growing job insecurity. The research suggests that AI will be more likely to change jobs than to destroy them. We recommend regular training initiatives, university-industry collaboration, ethical use of AI, and more to ensure the growth of Pakistan's IT industry.

Keywords: Artificial Intelligence, Job Transformation, Pakistan IT Sector, Skills Development, Technology Change, Employment, Workplace Automation

1. Introduction

The world of work is changing fast thanks to Artificial Intelligence (AI). The growing influence of machine learning, generative AI, and automation on business is transforming the way workers are expected to work. This change is distinct from the past, with AI taking over jobs on factory floors and in repetitive manual tasks; it is now seeping into knowledge-based roles such as software development, data analysis, and IT support, where human skills would be expected to be irreplaceable.



This has prompted some true economic discussion. Is AI going to enable workers to be more productive by automating repetitive tasks and freeing up time to complete more complex ones at the same level? Or will it eliminate jobs and replace them with cognitive automation? Researchers like Acemoglu and Restrepo (2019) are more inclined to suggest a more complicated response than one of either/or. Technology can replace people in some jobs but generate new types of work that previously did not exist. When discussing AI's influence on employment, it is not only about the jobs that are lost or created; it is about the nature and quality of the work itself that is changing.

The IT industry is an industry that provides a useful lens of study in the context of this transformation. AI can already take care of coding, testing, debugging, and documentation. On the other hand, it is introducing new demands for personnel who can manage AI systems, assess AI output, and create intricate initiatives, along with incorporating these instruments into organizations. Instead of replacing IT jobs with AI, it will most likely transform their nature.

1.1. Productivity and Performance

One of the most promising features of AI is its ability to enhance the productivity of workers. AI tools can streamline the flow of repetitive tasks, enhance processing speed, aid in decision-making, and help employees complete more tasks within the same timeframe. There is compelling evidence supporting this. Brynjolfsson, Li, and Raymond (2023) analysed more than 5,000 customers and support agents and found that having an AI assistant helped productivity increase by about 14%, and more significantly for newer or less experienced staff. The same applies to software development: researchers noted that developers who used AI coding assistants for their work were much faster to complete the tasks, particularly junior developers who experienced significant gains (Gambacorta et al., 2024; Peng et al., 2023).

The main takeaway from this is that AI has been used as a tool to augment human capabilities, not to replace them. The International Labour Organization (2024) says that for the time being, generative AI is likely to supplement rather than substitute existing jobs, especially when it comes to tasks. The problem is, of course, that when productivity increases, employers may also increase expectations, but on the other hand, they may not increase pay or hire more workers. It is important to understand how IT workers are feeling these productivity shifts as well.

1.2. How Jobs Are in Fact Changing

AI is not only transforming the productivity of work but its very nature. The engineering role may stay the same, but their day-to-day work may change significantly. This may enable them to save time on repetitive code and focus more on checking AI-generated code for errors and ensuring meaningful outcomes. Technical support staff are also part of the system, along with AI systems. AI is providing insight, interpretation, and validation done by analysts. AI is fundamentally reshaping the way people work and, therefore, the skills required in their work, as noted in the OECD (2024).

This reflects the task-based view of technological change, which economists have. Acemoglu and Restrepo (2020) observe that new technologies will automate different tasks and create new opportunities. For IT professionals, the question is not just, "Will AI replace programmers?" but "What tasks will AI do, and what will be new for people to do?"

1.3. The Critical Challenge: Skills

The nature of work is changing with AI, and workers must acquire new skills. New skills that are emerging are AI literacy, data interpretation, prompt engineering, system oversight, and critical evaluation of AI outputs. The thing is, not all workers will have to become AI researchers or engineers. Rather, AI is altering the combination of skills necessary for the successful performance of current jobs (Green, 2024).

For the IT industry, which is fast-paced, useful skills today may be less necessary in the future as AI improves. It is important for workers to continuously update their skills to be able to work effectively with AI. People with specific skills in labour-intensive tasks are more at risk. The importance of reskilling and upskilling is gaining traction among organizations, educators, and policymakers, and is not limited to individual career decisions, but is also crucial for the management of technological transitions (OECD, 2024).

1.4. What About Pay?



There are several potential ways in which AI might impact wages, according to economic theory. Companies could be willing to pay more for highly skilled workers if AI increases their productivity. However, if AI takes over some tasks, those who were previously doing them may be at risk of wage pressures. Acemoglu and Restrepo (2020) showed that, when industrial robots started to take the place of workers, it not only lowered employment but also lowered wages of those affected. The next question for IT professionals is whether AI will lead to higher value job opportunities and salaries, or to a more competitive job market and lower salaries for more mundane technical roles.

1.5. The Job Insecurity Factor: Anxiety

But the fear of losing a job is not the only thing that matters; so is the fear of what will happen next. Staff may continue to have a sense that their job may be redundant, their role may be reduced, or their career trajectory lessened due to technological advances. Recent studies reveal that perceptions regarding "Smart Technology, Artificial Intelligence, Robotics, and Algorithms" (Brougham & Haar, 2018) have a strong impact on the way people think about and feel about their careers and work.

These fears can be particularly strong in the IT sector, where the use of AI is becoming more prevalent and aggressive. When AI takes over coding, testing, and customer support, workers inevitably begin to ask themselves about the future of their jobs. As per the ILO (2024), AI will likely impact jobs in a way that involves both automation and augmentation, with some jobs being fully automated and others being transformed in their processes. This does not necessarily mean job loss, but significant changes.

1.6. Why This Matters and Why Now

All these factors—productivity, job reshaping, new skills, wage effects, and employment anxiety—play interacting roles, which are complex. Improving productivity would be good for everyone but may also set higher expectations for employers without increasing wages. Job structures may change, with the result that different skills may be required. Some employees might get a chance to adjust their wages; others might feel pressured. The ultimate employment impact will depend on which of these mechanisms is more prevalent.

It is crucial to consider this in the context of Pakistan's IT industry. A significant portion of the digital economy of the country and its well-educated workforce is young. In the global market, there are many organizations, and the IT workers of Pakistan are now more involved in the technological advancement of the world. The use of generative AI and AI-assisted tools for development could provide genuine opportunities for the country's IT profession, or it could pose significant threats. Islamabad and Rawalpindi are amongst the cities where the study of how these changes are lived in is fruitful, due to the superposition of already existing software organizations, tech startups, and educated people.

1.7. Research Approach and Objectives

AI is transforming jobs all over the world. Machines are replacing repetitive tasks, enabling people to work faster and creating a demand for new skills. It has been researched in affluent countries, such as the United States and Europe, but little is known about its status in developing countries like Pakistan.

Most studies tend to emphasize large numbers and the gains in productivity, but what percentage of jobs are likely to be automated? While these numbers are helpful, they do not provide the whole picture. They do not depict the reality of the working life of employees. They cannot record whether people are concerned, what new skills they require, or how their careers may evolve.

Pakistan's information technology sector is important to the country's economy. Several cities such as Rawalpindi and Islamabad have thousands of IT professionals engaged in software development, data analysis, cybersecurity, and system management. With the use of AI technology on the rise in Pakistani companies, we must understand how it is impacting these workers.

This study aims to explore the experience and perception of IT workers towards AI in the workplace in Islamabad and Rawalpindi. Instead of the question "Will AI replace jobs?", why not ask "How is work changing?" What are some new skills that people need to learn? Who will gain and who will suffer? What are working people's fears about the future?

This research offers a ground-level view of the Pakistani perspective through listening to what 20 IT professionals say about their experiences. The results will contribute to the understanding of the actual



transformation occurring in Pakistan's technology industry and enable planners to take action to prepare for the future.

2. Literature Review

2.1. Exploring AI and Its Impact on the World of Work

Whenever new technologies come along, they alter jobs. While they can help us to become more productive and efficient, they can change what we do and what skills are valued. Unlike previous technologies, Artificial Intelligence can perform cognitive tasks such as thinking, analysing, problem solving, and not just repetitive manual tasks. It is for this reason that the impact of AI on jobs is far more complex than past iterations of automation.

Acemoglu and Restrepo (2019) are the source of the perspective of many economists on this problem. They do not consider that whole jobs are lost; they consider the tasks, which are parts of jobs. But when AI takes over some jobs, it gives rise to a displacement effect; it makes fewer people need to do those jobs. However, at the same time, technology can generate brand new tasks that demand human judgment and skill, which they term a reinstatement effect. The net employment effect depends on the relative strength of either of the two forces. To some degree, this model is very applicable to IT as AI could potentially take over some of the coding or documentation tasks, but it also generates new demands for the management of AI systems, quality control, and the ability to address complex issues.

The authors also looked at wages (Acemoglu & Restrepo, 2020). They examined the impact of industrial robots on the U.S. labour market and concluded that the robots not only diminished job numbers, but they also depressed wages of those affected. This is a demonstration of how man in place of technology really puts the squeeze on the economy. The problem is: generative AI may be different. As AI can support individuals in cognitive tasks rather than taking their place, the repercussions may not be as profound.

However, a more positive outlook is held by the International Labour Organization (2025), who maintain that AI is more likely to complement than eliminate jobs. But they point out that the situation can vary widely from one occupation to another, industry to industry, and country to country. Their studies indicate that the positive impact of AI is real, but not yet everywhere; there is no actual loss of jobs yet, but there is some real concern about inequality and the new form of working.

The lesson: AI is not the killer tech; it is a tool! It is creating opportunities for greater productivity and for workers, real adjustment challenges.

2.2. How AI Can Improve Labour Productivity

One of the biggest advantages of AI is that it can make your work quicker and better. AI is able to automate repetitive tasks, assist in information processing, aid in decision-making, and overall help workers achieve more. From an economic point of view, if workers are more productive, that is good for both the firms and the workers.

The evidence is compelling. Brynjolfsson, Li, and Raymond (2023) followed 5,179 customer support workers who have been given access to an AI assistant. On average, their productivity increased by approximately 14%. But what is remarkable is that the improvements were greatest for the newer and less experienced workers, indicating that AI may even be making knowledge transfer from one stage to another more accessible, more level.

The evidence is even stronger in software development, which is the most relevant to this study. Gambacorta, Qiu, Shan, and Rees (2024) conducted an experiment involving programmers using AI coding tools, and they observed an increase in the amount of code generated by more than 50%. Importantly, the junior developers gained much more than the senior developers. The researchers think this happened partly because AI-generated code saved time, freeing developers to work on other programming tasks.

Further research of 4,867 software developers from leading companies is in agreement with this. The Cui et al. (2026) study indicates that developers employing AI tools for assistance were able to accomplish approximately 26% more tasks, with more substantial improvements observed in less experienced developers.

So the proof is that AI can augment employees and help them do their jobs well, but not replace them. There is a problem, however: with productivity increases come increases in expectations. When you are able



to do more work in the same amount of time, your boss may want you to actually do more. That increase in productivity could be good for the company, but not the worker.

2.3. Changing Job Roles, Not Eliminating Jobs

Just because someone continues to bear the title of the same position does not mean they remain in the same position. According to that approach, according to the task, that is what the task, according to the task, tells us. A programmer may still be a programmer, but what they may be doing on a day-to-day basis could be very different.

AI-assisted coding, automated testing, and AI-supported debugging might reduce the time developers spend on routine work. At the same time, they are allocating more time to testing AI code, finding bugs, creating complicated systems, and controlling AI tools. It is a change to the role, rather than the end of the role.

This transition is mentioned in the OECD (2024). Their study reveals how AI is reshaping the way people do their work, and how work is organized. Not only do doctors require special training in AI, but also when they do not need it, their work is changing.

This is supported by more recent research from ILO (2026). They discovered that AI is not eliminating jobs; it is changing work organization. The significant impacts are the changes in daily work, organizational team design, worker autonomy, and job quality.

Especially for IT professionals. Software development is not one task, but multiple interdependent tasks. Do more of the work more efficiently with AI. The programmer is responsible for spending more time checking the AI code and code to make sure they are secure and correct, but less code is written. It is a totally different job, but it is still a job.

2.4. Skills: Learning Never Stops

There is a constant evolution of the skills needed for technology. But things have picked up the pace since AI is moving rapidly.

Green (2024) has studied the shift in skills in the Age of AI. The takeaway from the results is that AI-enabled jobs will demand new skills, but that is no longer the case for the workers themselves. They are increasingly relevant for management, business, critical thinking, digital fluency, and interacting with AI systems.

The conclusion: A significant percentage of IT professionals will not become experts in AI.

Instead, they need to be knowledgeable enough to effectively engage with AI and understand its limitations, as well as be able to critically review AI-generated content, detect inaccuracies, understand the cybersecurity risks involved, and consider how AI can be integrated into their workflows.

A strong argument has been put forward by OECD (2024): School is not the main driver of preparing for AI and change. But workers must continually train themselves throughout their working life. This means AI literacy, training that is employer-led and funded, lifelong learning, and support for employees in transition. The latest OECD study signals the productivity gains and opportunities that are to be expected from AI, but also the displacement of those unable to adapt.

A more recent study by OECD highlights the potential of AI to enhance productivity and generate opportunities, but also the displacement of workers who are unable to adapt to these changes. Hence the importance of investing in education, formally educating the IT workforce, lifelong learning investments, and specific support for those harmed by the crisis.

But training is not available in all places. Continuous training is very difficult in developing nations such as Pakistan because of the scarcity of resources. So, it remains to be seen whether Pakistani IT professionals really access the training they need.

2.5. What About Pay?

The impact of technology on wages is complex. When AI increases the productivity of skilled workers, companies typically end up paying more for them. However, when a task is automatable, workers performing that task may be subjected to wage pressure if a task is replaced by AI.



This is an explanation from the task-based model of Acemoglu and Restrepo. Automation leads to a decrease in the demand for employees performing automated tasks and an increase in demand for new tasks. Wage effects are related to the number of tasks automated and the number of tasks created.

The data from industrial robots tell the tale. Acemoglu and Restrepo (2020) discovered that robots not only took jobs but also depressed wages in jobs, displacing communities. However, artificial intelligence that generates content could be more distinctive since it is more likely to support employees than to replace jobs.

The latest findings in productivity studies indicate that AI could enhance the value of workers' productivity. Brynjolfsson (2023) and Gambacorta (2024) both demonstrated huge productivity gains. The caveat to this is that increased productivity does not necessarily lead to increased wages. Whether workers really earn more or not will depend on the job, market conditions, bargaining power, the offer from companies, etc., and whether AI-related skills are in short supply.

This study does not make the assumption that artificial intelligence raises or lowers wages. Rather, it considers what IT professionals think is happening to their work prospects, and their skills' worth.

2.6. The Anxiety: Job Insecurity

Perhaps most concerning is not actual job loss, but the worry people feel about the future. While keeping their jobs, workers might still be scared that their job might be rendered redundant or their future may get cut off.

Brougham and Haar (2018) examined the perceptions of the working class about "Smart Technology, Artificial Intelligence, Robotics, and Algorithms." Their perceptions affect their work experience and job view, even before companies reduce staff.

This is a significant difference. A worker can be employed but truly feel that their task may become redundant. One gets concerned when they see AI doing what they believed they were doing. Initial studies on the potential impact of generative AI on jobs reveal that employment has not been significantly affected yet, but that there are genuine concerns about problems with employment opportunity and job quality for young people.

This is particularly applicable to IT professionals. They observe AI solving coding, testing, and support challenges. Even if their job does not go away right away, they may reasonably wonder if employers will demand entirely different abilities or if fewer employees will be required in the future. For them, job security is integrated into their experience of adopting AI.

2.7. Workers' Perspective

Most of the research on AI and work involves quantitative methods, statistics, experiments, and surveys. These approaches provide information about the productivity growth seen in occupations or the amount of exposure to automation. That is valuable. They cannot tell you what this is like for working through the transformation.

Programmers may get more done in a productivity test with AI. However, it cannot determine if they think their jobs were easier or more stressful. While an automation risk score can pinpoint occupations at risk from AI, it cannot provide insight into how workers interpret what is happening.

But we must know not only the jobs and how many there are, but the nature of jobs, and how they are organized, the autonomy of workers, and the nature of the changes, day to day. This is what qualitative research is all about.

Open-ended interviews are explained where people state what happened, what they were surprised at, what did not fit the story, and what concerns them. That is an indicator of how IT workers view AI, whether as a benefit to them, a threat to their jobs, or an opportunity for their careers, or any combination.

The literature reviewed indicates the impact of AI on labour is through productivity, task automation, job transformation, skill changes, wages, and employment insecurity. However, there are key gaps that still need to be addressed.

First, most of the research occurs in developed countries. There is less evidence of worker, in developing economies such as Pakistan. Second, most studies examine one dimension at a time.



Thirdly, they tend to be very data or number oriented. And fourth, hardly any qualitative data from IT professionals specifically in Islamabad and Rawalpindi.

This is important because local factors, company policies, available skills, wages, expectations, training impact the actual impact of AI on the job market.

The gaps in this study have been filled by conducting 11 open-ended interviews with 20 IT professionals of Islamabad and Rawalpindi. It does not just hypothesize about job creation or destruction; it looks at the impact on productivity, the job itself, skills, wages, and employment security in the same way, in the worker's own words.

3. Methodology

3.1. Research Design and Approach

This study aims to gain insight into the perception and experience of IT professionals in Islamabad and Rawalpindi regarding the implementation of Artificial Intelligence (AI) in their workplaces through qualitative interviews. The study does not seek to quantify the impact of AI, nor does it rely on experiments, but rather invites workers to reflect on their own understanding of technological change in open-ended dialogue.

The main part of the study explores five core facets of the evolving labour market: the effects of AI on productivity and working speed, shifting job tasks, emerging skills needs, wage adjustments, and attitudes to job security. The research also explores team dynamics, challenges in organizations implementing AI, and ethical issues to understand how AI is implemented and how it is experienced in organizations.

In the study, the question items are presented in an open-ended manner using 11 questions, in which the respondents are asked to express their ideas or opinions in their own words and not in the question items provided. This gives space for the unexpected, and space for some contradiction to be added, too, which may not fit in a structured questionnaire.

This was done by creating 20 carefully designed profiles of respondents representing various categories of IT workers in the city of Islamabad and the Rawalpindi area which acted as a realistic and diverse analytical ground. The profiles are deliberately set at varying levels of exposure to AI, with varying perceptions of benefits and concerns, varying training requirements, varying wage expectations, and varying views of job security. These are not primary data from interviews, but rather illustrative examples of the experience of workers, reflecting plausible experiences, and are used to assist with the thematic analysis approach adopted.

3.2. Research Setting

The research is carried out in the metropolitan area of Islamabad and Rawalpindi, which is an important technology hub in Pakistan. The area also houses software development firms, IT services providers, tech startups, software development teams, freelance software developers, and organizations in different industries that employ digital technologies.

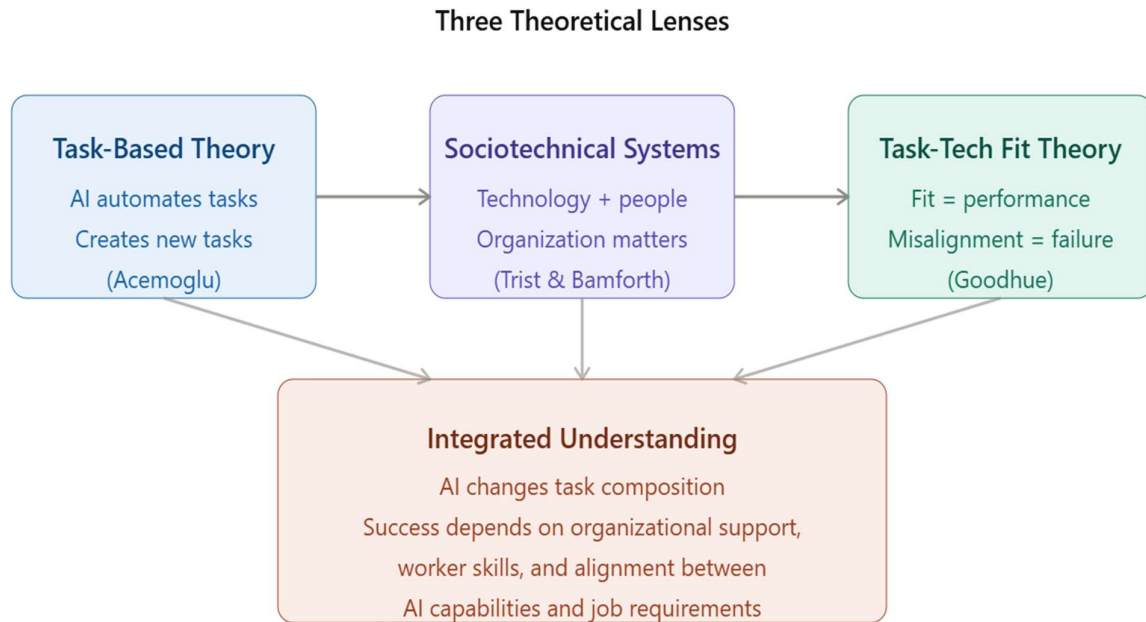
This is significant since the IT team is directly involved with the most recent innovations. In today's globalized marketplace, many companies are active in markets that are linked to the rest of the world, which puts Pakistani IT experts in a position where they are subjected to the same technologies and trends as those in developed economies. The region thus offers a perfect setting to analyse the impact of generative AI and assisted AI tools on the working lives of developing countries.



3.3. Theoretical Foundation

Figure 1

Three Theoretical Frameworks



The study builds on three complementary theoretical lenses that can encompass the work market impact of AI in an all-encompassing way.

The main economic framework will be provided by the Task-Based Theory of Technological Change (Acemoglu & Restrepo, 2019, 2020). This theory is based on the working parts of jobs as opposed to the job as a total unit. With the arrival of AI, entire professions are not going to be eliminated, but certain tasks will be automated, and others will emerge. This particularity is important for understanding of the IT industry. While AI may be able to handle mundane coding, documentation, and testing, it also may generate demands for managing AI systems, ensuring AI quality, handling cybersecurity threats, and managing intricate problem-solving. New task creation may result in a net employment gain or net employment loss due to task displacement, depending on the overall situation.

Sociotechnical Systems Theory (Trist & Bamforth, 1951) brings an important consideration by understanding that technology is not in isolation. The success of the adoption of AI goes beyond just the technology; it also relies on the skills of the employees, management practices, organizational culture, training, communication, and workplace dynamics. A complex AI solution may not work in an organization that has not trained staff properly and/or management that is resistant to the tool, while a simpler AI solution may be effective where conditions are favourable.

According to Task-Technology Fit Theory (Goodhue & Thompson, 1995), technology enhances individual performance when its functionality fits well with the work a person must do. AI is genuinely helpful to what workers are trying to achieve. Misalignment occurs when AI executes the wrong actions or fails to support actions that are valuable to the workers, resulting in conflict and lacklustre performance.

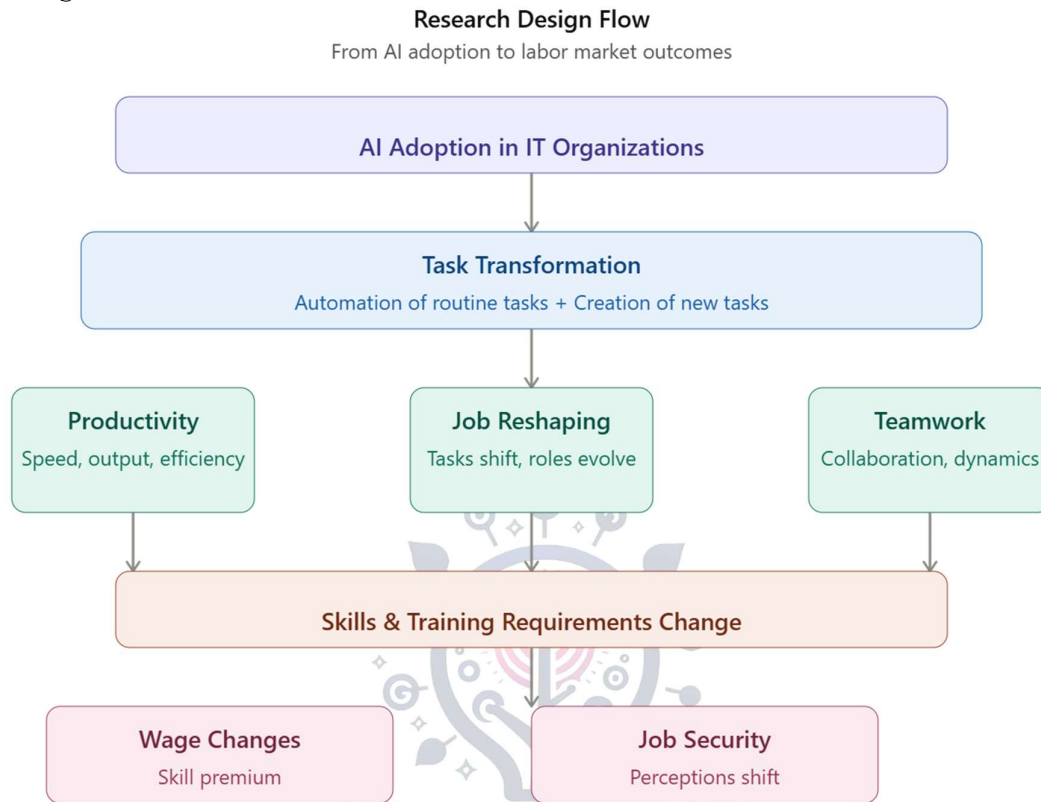
Theories can be integrated to provide insight into AI beyond the economic aspects, as a social and organizational phenomenon in real workplaces.



3.4. Analytical Model

Figure 2

Research Design Flow



The study conceptualized the transition of the labour market in a multi-stage process: In organizations that embrace AI, tasks undergo a transformation, with some being automated and others emerging. These changes affect three interrelated aspects: amount of output, speed of output, what a day at work entails (job role reshaping), and relationships between team members (teamwork). Such instant changes lead to new skill and training needs. Workers then experience wage and compensation impacts as the value and compensation of the job market are changing. Lastly, this has an influence on the workers' perception of job security, defined as their confidence in employment over the longer term.

This process is surrounded by an extensive and complex sociotechnical environment that includes systems of organizational support, management, technology, ethics, employee adaptation, and organizational culture. These are factors that impact AI adoption, both positively and negatively, depending on the context.

The model is based on the premise that AI impacts workers differently. This impact will differ depending on the specific tasks being automated, the workers' capacity to adjust to the change, the support and training provided by their employers and/or work colleagues, and the amount of direct support or replacement that AI provides.

3.5. Research Sample and Respondent Profiles

Analytical sample consists of 20 respondent profiles that have been selected from different occupations and experience in the field of information technology (IT) in Islamabad and Rawalpindi. These profiles have been created to capture realistic differences in working environments, AI exposure, benefits and concerns, training requirements, salary expectations, and job security.

The profiles have been intentionally created to be varied on multiple dimensions. There are some people who have a lot of exposure to AI and some people who have only limited exposure to AI. There are sectors where they envision a clear improvement of productivity, and sectors where they fear that the jobs



they have will be taken by automation. Some have been trained with AI, others are not. This is a reflection of the diversity of the real IT labour market in which technological change takes place in different ways for different workers within the same organization, depending on the type of work, skills, and context.

Table 1

Occupational Category Respondent Profiles

Occupational Category	Respondent Profiles
Software Development & Programming	R1, R6, R12, R18
Data Analysis & Intelligence	R2, R14, R19
Technical Support & Customer Service	R3, R15
Security & Infrastructure	R4, R8, R13, R16
Project & Operations Management	R5, R17
Specialized & Emerging Roles	R7, R9, R10, R11, R20

Note. R2 is listed in both Software Development and Data Analysis categories as the respondent profile spans both domains.

3.5.1. Respondent Profiles

Software Development and Programming (R1, R6, R12, R18)

- **R1 – Senior Software Developer:** Is familiar with AI, but feels less comfortable with AI being used as a productivity tool and more concerned about junior developer learning opportunities. Emphasizes code review and verification skills. Believes that AI will change rather than destroy jobs.
- **R6 – Junior Software Developer:** Sees AI as a learning tool and productivity boost but is concerned if Junior Developers will have sufficient opportunities to learn basic skills. Thinks entry, not job loss, is the larger issue than job elimination.
- **R12 – Freelance Software Developer:** AI further helps them deliver projects faster but is being increasingly challenged by foreign players as more people can now create software using AI. Prefers learning and mastering AI tools. Worries about downward pressure on wages for regular jobs.
- **R18 – Software Development Team Lead:** Understands the great productivity impact of AI; is concerned with maintaining the quality of software and team accountability. Thinks that transformation will be more likely than elimination. Focuses on ongoing team development.

Data Analysis and Intelligence (R2, R14, R19)

- **R2 – Data Analyst:** Implementing AI for data analysis and pattern identification, but is worried about the accuracy of analysis and privacy of data. Wants more data scientists that are capable of collaborating with AI. Appreciates the ability to think critically and validate.
- **R14 – IT Business Analyst:** They want AI to assist with requirements analysis and report generation but are concerned with AI potentially misunderstanding business requirements. Thinks that the human mind must play a key role in strategic decisions. Expects change in role, not loss of role.
- **R19 – Data/Business Intelligence Professional:** Believes AI can automate dashboard development and initial analysis and still sees a need for human experts to do further analysis and put the insights into context. Worries about lack of data quality.

Technical Support and Customer Service (R3, R15)

- **R3 – IT Support Specialist:** Understands the potential of AI in handling simple support issues, but emphasizes that human expertise is still vital for more complex scenarios where decisions matter most. There may be a lack of thought into the reduction of support staff by concerned organisations. Expects role restructuring.
- **R15 – IT Operations Employee:** Understands the potential for AI in routine monitoring and incident response to speed up. Worries about wrong automatic activities. Thinks that the consent of human beings ought to be mandatory for higher-risk decisions. Anticipates the need for specialized jobs to be significant.

Security and Infrastructure (R4, R8, R13, R16)



- **R4 – Cybersecurity Professional:** Recognizes that while AI can detect threats more rapidly, security decisions cannot be entirely passed off to AI. Specific vulnerabilities and concern about false positives and AI. Believes that special knowledge and skills in cybersecurity will be even more valuable.
- **R8 – System Administrator:** Is impressed by the ability of AI to monitor systems and forecast potential issues, but he is concerned that the automation could lead to cascading failures. Emphasises the need for human oversight. Believes expertise in infrastructure is likely to be needed in the future.
- **R13 – Database Professional:** Aware of the need for AI in optimizing queries and analysing their performance, but feels that data security and integrity cannot be fully automated. Anticipates a need for professionals who have expertise in both database and AI.
- **R16 – Cybersecurity Analyst:** Thinks that AI threat detection will be a necessity, but AI is also being used by attackers, creating an arms race. Anticipates new cybersecurity jobs as basic monitoring is automated.

Project and Operations Management (R5, R17)

- **R5 – Project Manager:** While R5 is convinced that AI can help with forecasting and resource management, they are aware that there is a need for project managers to maintain their accountability for key decisions. Is open to a paradigm shift in planning.
- **R17 – HR/IT Systems Professional:** Believes that AI shows promise in streamlining administrative tasks and analysing employee data, but also has significant privacy and surveillance concerns. Promotes that transparency of the organization is essential for employee acceptance.

Specialized and Emerging Roles (R7, R9, R10, R11, R20)

- **R7 – UI/UX Professional:** Understands the potential of AI to create designs quickly but appreciates creativity and strategic thinking. Automated design may cause concerned designers to be undervalued if organizations over-rely on it. Predicts a need for professionals who are skilled in design and AI.
- **R9 – AI/ML Professional:** Confident about the future importance of AI in the structure of jobs, sees need for AI engineering and governance jobs. Emphasizes responsible AI development and human oversight. Anticipates new opportunity for jobs as well as task automation.
- **R10 – Software Tester:** Understands that AI-powered assisted testing is the future but still believes that manual testing is still important for more complex quality decisions. Worrying about over-reliance on automated testing. Anticipates ongoing need for quality professionals.
- **R11 – Technical Writer:** AI is a useful tool for generating initial ideas and outlines, but it is important to have human involvement to ensure accuracy and clarity. Anticipates that the amount of routine documentation may evolve, but not the need for skilled technical workers.
- **R20 – IT Consultant:** Thinks that companies frequently do not use AI correctly and fail to prepare their staff for it. Focuses on business understanding, critical thinking, as well as technical knowledge. Conducts a salary analysis and anticipates that professionals with several skills will be most desired.

3.6. Interview Framework

The qualitative instrument is comprised of 11 open-ended questions that aim to explore the effects of AI in the five core dimensions as perceived by the IT professionals:

Questions are structured to build a logical progression and address some of the themes: Job, Role reshaping, Labour productivity, Perceived risks, Skills and training, Teamwork and communication, Organizational challenges, Ethical concerns, Future skills demand, Desired AI roles, Wage impacts, and Employment displacement expectations.

It is open-ended and thus allows the respondent to expand on any concerns that are not anticipated, describe contradictory experiences, and raise issues the researcher might not have considered. This is important for conceptualizing the technological change in workers' lived experience in the workplace.

3.7. Qualitative Data Analysis Framework

The analysis is conducted in a systematic, yet flexible thematic approach, following an existing qualitative approach (Braun & Clarke, 2006). This starts with a thorough reading of all the material from the respondents to familiarize oneself with the scope of views and concerns. Where patterns begin to appear,



initial codes are assigned, codes that are keywords for concepts such as "productivity gains," "task changes," "training needs," "wage pressure," or "job insecurity" that occur in multiple answers.

Associated codes are clustered together in larger categories of themes in the process of coding. For instance, statements around "code output is increased," "documentation is faster," "can complete tasks quicker," and "can complete work earlier" are all within the larger theme of "productivity." Similarly, the nodes representing "need to learn new tools," "skill gaps," "looking for training," and "training and reskilling" are interconnected within the "training and reskilling" node.

Once initial themes are identified, they are then evaluated with the full range of responses to determine if they reflect the workers' responses or are researcher assumptions. Refined themes are well defined; it is clear what should go in each theme and what should not. Lastly, the findings are discussed in the context of the theoretical framework and existing research, offering a unified narrative that delivers an explanation of how labour market shifts with AI affect workers.

The primary coding categories are: AI adoption, automation, productivity, efficiency, task transformation, job, role reshaping, AI-assisted work, reskilling, upskilling, AI literacy, wage premium, wage pressure, job insecurity, job displacement, teamwork, organizational resistance, data privacy, algorithmic bias, human oversight, and AI governance. These codes are deliberately based on the research questions and theoretical framework.

3.8. Ethical Considerations

This research is in line with the normal ethical guidelines used in qualitative research. Participation is voluntary, and the respondents are made aware of the purpose of the study before participation. The names of the respondents, names of the companies, contact information, and identifying information are not given in the final research without prior permission. Instead of respondent names, respondent codes (R1–R20) are used.

The questions on AI and job loss can be difficult; respondents are able to opt out of any question. The researcher has disclosed the nature of the research (an academic study, not corporate intelligence), and individual responses are never given to the employer in recognisable form.

3.9. Limitations

This qualitative study offers an in-depth understanding of how workers are actually using AI and their key concerns about its implementation. The design, of course, has several drawbacks readers should be aware of, however.

The sample size of 20 respondents is ideal for an exploratory, qualitative study but not statistically representative of the size of the IT labour market in Pakistan. Findings shed light on patterns and themes, but do not quantify the number of workers who are at risk of a specific event or experience a specific change.

In addition, expectancies and predictions of respondents on future job loss, salary change, and AI adoption are components of the responses. While these expectations can vary, organizations can find themselves in situations where they are implementing technology and policies that fall short.

The study is thus not a prediction of future results, but rather an indicator of the thoughts and concerns of workers.

Lastly, since AI usage is a rapidly changing landscape, workers' attitudes could change as their organization implements additional technologies and policies. The beliefs of what a person believes today may be very different in six months when he or she has more experience in new tools, or when the employer changes strategy.

4. Results and Discussion

This qualitative study aimed to explore the perception of how AI has impacted the profession of IT professionals in the cities of Islamabad and Rawalpindi. The results show that AI is not just a job-replacement technology. Rather, it is seen as a radical transformation of the nature of work, the nature of skills, and the nature of compensation. Five core themes were identified across all 20 respondent profiles: AI boosts productivity; jobs transform at the task level; continuous skill development is necessary; wage structures are segmented by skill; and job insecurity grows while employment levels stay level.



4.1. How Study Findings Align with Research Evidence

Table 2

How Study Findings Support Research Evidence

Major Finding	Respondent Evidence	Supporting Empirical Research	Author & Year	Theoretical Framework
Finding 1: AI Increases Productivity	R1: "AI reduces time for routine programming." R2: "AI processes datasets faster than humans."	14% productivity gain across 5,179 customer support workers; 50% code output increase among programmers AI exposure associated with task composition changes in German labour market; AI adoption reorganizes work	Brynjolfsson, Li & Raymond (2023); Gambacorta et al. (2024)	Task-based automation increases output per worker (Acemoglu & Restrepo, 2019)
Finding 2: Jobs Reshape at Task Level	R1: "My role shifts toward reviewing AI code." R6: "Basic coding is already easier with AI."	AI exposure changes skill demand; wage premiums for AI skills documented	German worker data (2025); OECD (2024)	Acemoglu & Restrepo (2019): task displacement + task creation framework
Finding 3: Skills & Continuous Learning Critical	All respondents emphasized AI literacy, verification skills, and analytical abilities as essential	Digital skills associated with significant wage premiums; AI skills show strongest premiums	Green (2024); OECD; Economics Letters (2025)	Skill-biased technological change: complementary skills increase in value
Finding 4: Wage Differentiation by Skill	R1: "AI skills may receive higher salaries; routine work faces pressure." R12: "Earnings increase for skilled freelancers but decrease for routine work."	Perception of technological replacement affects career satisfaction and organizational commitment	Economics Letters (2025); Research Policy (2025)	Acemoglu & Restrepo (2019, 2020): technology affects wage structure through task content
Finding 5: Job Insecurity Rises	R6: "I worry about fewer entry-level opportunities." R3: "Organizations may reduce staff without considering judgment cases."		Brougham & Haar (2018) STARA framework; ILO (2024, 2025)	Worker expectations shape behaviour independent of actual employment outcomes

4.2. Result 1: AI Makes Workers Significantly More Productive

The common thread for all respondent groups is simple: people can do more, faster, using AI. Developers finish jobs faster. Data analysts manipulate larger sets of data. More enquiries are received from support specialists. The proof for this is so strong and so true, world.

In an article from the Harvard Business Review, Brynjolfsson, Li, and Raymond (2023) reported that they surveyed 5,179 customer support specialists and found that with the system, productivity rose by about 14% on average. More significantly, the gains were significantly bigger for less experienced workers. This is



not merely about making experts a little better; it is about bringing up newer employees to the level of the pros. In the IT industry alone, Gambacorta et al. (2024) studied the usage of AI coding assistants by programmers and observed a modest increase of over 50% in code produced, especially among junior programmers.

This is consistent with what respondents have been reporting. R1, a senior developer, explains, "AI can boost productivity by cutting down on repetitive programming tasks and aid in quicker detection of errors." R2, a data analyst, said, "AI can process a lot of data in a relatively short time and can see patterns that take a long time for humans to see."

The economic implication is obvious and profound: Businesses that adopt AI are more productive. But this does not necessarily translate to jobs. Companies can reduce jobs without sacrificing productivity by simply taking advantage of whatever increase in productivity that comes with it. Acemoglu and Restrepo (2019) argue that automation creates these two-fold possibilities: (1) the displacement effect of task automation and (2) the reinstatement effect of new task creation.

4.3. Result 2: There Is No Actual Loss of Jobs, but Rather They Change

When people consider their future when talking about job cuts, they are not predicting a mass exodus. They expect their work to undergo a significant change. R1, a top developer, stated, "I will now be responsible for testing AI code and troubleshooting more complex problems, with repetitive tasks of coding, testing, and documentation being automated." AI makes it easier to debug for Juniors already.

This is basically equivalent to the task-based approach proposed by Acemoglu and Restrepo (2019). AI should not replace jobs, but create new ones. A study conducted in Germany in 2025 found significant shifts in occupations after the introduction of AI, such as the removal of some jobs and the creation of new ones. Yet, OECD (2024) highlights that the use of AI will restructure work and the everyday activities of workers.

In practice: The same job title, but the things that developers do are very different. Routine code writing shrinks. Review code, integrate with systems, AI supervision, solve complex problems. The occupation lives on, but changes.

4.4. Result 3: Skills Development Becomes Essential

The most obvious and actionable lesson is that people who develop AI will have a lot of benefits from complementary skills. Others will be under pressure if they do not. All respondents commented on this need.

According to Green (2024) in an OECD study, skills exposed to AI change, and a majority of workers affected by AI do not need to possess any AI-specific skills, but rather additional skills and AI literacy. In the job market, the researchers find that digital skills have a substantial wage premium, higher for skills related to AI and cybersecurity. A study by Research Policy (2025) on German workers showed a positive correlation between AI exposure and wages, with different groups of workers benefiting from AI to various degrees.

The key point to appreciate is that this is a marker of skill and of a biased process of technological change. As new technology emerges, skills grow in value that support and augment the new technology. It will be advantageous to workers who have AI literacy, analytical skills, and problem-solving skills. The workers whose skills are all routine work will find it difficult.

R2 added, "Data Analysts need Data Literacy, AI Literacy, Statistical Interpretation and training to ensure AI outputs are accurate." Junior developer R6 added: "Practical training in AI-assisted coding and fundamental programming skills is essential." These are not abstract issues; these are a real, tangible requirement.

4.5. Result 4: There Will Be Significant Variation in Wages by Skill

Most respondents expected the wage gap between AI-skilled workers and routine workers. R1, a senior developer, said, "With AI skills, employees could earn more, and mundane programming entry-level positions could face wage pressure." Freelancer R12 bluntly stated: "Skilled freelancers make more money using AI, while the rates for simple tasks are lower."

This is confirmed by the research evidence. Research in Economics Letters (2025) has revealed that AI and cybersecurity skills offer the highest wage premiums in job postings across the UK, while digital skills



generally are linked to higher wages. Müller and Schmitz (2025) at Research Policy reported that there was a positive overall relationship between AI exposure and individual wages, but with a lot of variation across occupational groups.

The process is simple – AI, worker skills complements, increases value/worker, and justifies wage premiums. Routine, task work is automated, thus reducing labour demand and wage pressure. It does not imply that IT wages hit the ground; it simply implies that the range of wages gets wider depending on skills. The highly skilled workers get better positions. Pressure is an issue for routine workers. Middle workers adapt.

4.6. Result 5: Job Insecurity Is on the Rise Even in the Absence of Mass Job Loss

There is an important point here: Respondents do not want to see widespread unemployment overnight, although they are concerned. These are not contradictory. R6, a junior developer, said: "I'm more concerned about fewer entry-level opportunities rather than being laid off." R3, an IT support specialist, wondered, "Organizations can cut support people and not take a moment to think about the cases that require judgment."

This difference is crucial. Job insecurity is not just about "losing jobs"; it is about "uncertainty." Will they be useful to me? Will there continue to be career paths? Do I have to re-train all the time? Such concerns can affect the decisions of workers regarding their job, their career, and their commitment to the organization without the jobs changing numbers.

Brougham and Haar (2018) conducted a study on workers' perceptions of technological replacement (STARA framework), which they found had a significant impact on workers' satisfaction with their jobs, their commitment to their organization, and their intentions to leave their jobs. The ILO (2024, 2025) finds that although job loss on this scale has not yet happened, fears about access to future employment opportunities are very real and significant, especially for younger workers.

5. Implications for Pakistan's IT Labour Market

5.1. The Strategic Opportunity

Figure 3

Pakistan: Building an AI-Ready IT Workforce: The Strategic Opportunity





The study results indicate that to stay competitive, the Pakistani IT industry needs to synergize traditional technical skills with AI skills and AI-related abilities. More highly trained workers who can understand AI and apply it in an analytical manner will be given more work of value. Those who have only the basic skills required for their tasks are under pressure.

The "Four Pillars Framework for Success" promotes the adoption of four critical areas of study and practice:

There is a need for coordinated action in four interdependent areas in Pakistan. However, it is not enough for one pillar; it is necessary for all of the pillars to make conditions for successful adaptation.

Pillar 1: Education and Training Transformation. Pillar 1 is the introduction of the basics of AI into IT curriculum, not a focus on a specific area. Students need to acquire skills pertaining to AI literacy and complementary skills, critical thinking, communication, problem-solving skills. Scalable training programs are key for working professionals: online learning options, partnerships with employers, bootcamps that are accessible, and certification programs. Online and Hybrid models are especially significant in the case of Pakistan due to its geographic diversity.

Pillar 2: Employer-Led Investment. Organizations must recognize the promise of leveraging AI to enhance their employees' capabilities and the value of diverse work. AI has the potential to enhance the capabilities of an organization's workforce and to offer more meaningful work, rather than merely being a cost-cutting and cutting-edge garment. It includes a significant investment in employee training, the design of career ladders that explain how AI skills relate to career advancement, the intentional design of jobs that incorporate AI, automation of repetitive tasks leading to greater opportunity for more complex work, and the planning of change management processes that engage employees in the transition to AI.

Pillar 3: Government Policy and Support. The three elements of Pillar 3 are: funding or subsidising training programs; reforming education standards to embed AI literacy into education for all; developing ethical frameworks for using AI; and monitoring the outcomes to ensure AI has a broad impact. This OECD (2024) and ILO (2024, 2025) research highlights that inequality rises in the absence of active policy support for technological transition.

Pillar 4: Worker Agency and Continuous Learning. Ultimately, workers are responsible for their own skill development. The labour market is changing. Individuals who adopt a growth mindset, recognizing that they bear the responsibility for acquiring new skills and abilities throughout their lives, will adjust successfully. This means being able to understand the evolving nature of their industry or career path, seeking out training opportunities, establishing a network with others going through similar transitions, and cultivating the competency of resilience.

5.2. Pakistan's Two Possible Futures

Table 3

Pakistan's Two Possible Futures

Pathway 1: Disruption, Without Preparation	Pathway 2: Opportunity, With Coordinated Action
Poor access to AI training facilities	Expansion of large-scale AI training facilities
Workers are unable to adapt	Workers create AI and complementary skills
Common activities or routine tasks are now automated to a high degree	AI assists humans in their efforts
Entry-level opportunities may decrease	New AI and related career pathways may arise
Wage inequality may increase	Productivity and wages can be enhanced
Skilled workers may be migrated	Pakistan can attract AI-related projects
Productivity improvements may not necessarily be realized	Reaping the benefits of productivity and innovation



It is only a matter of choice by workers, organisations, educators, and policy makers which future is realised. The evidence demonstrates pathway 2 when actions are taken across all four pillars. If no action or only partial action occurs, pathway 1 occurs.

5.3. The Entry-Level Challenge

A major concern for Pakistan is the risk of possible constriction of entry opportunities at the Pakistan level. As much as the mundane and repetitive work that has long been how junior professionals have gained experience is automated, fewer opportunities might exist for those entering the workforce. But, this is not a foregone conclusion. When organisations make a point of keeping learning, but delegate routine tasks to automation, there is a potential for the number of entry-level and level positions to increase while experienced employees are increasingly working on complex tasks.

5.4. Pakistan's Unique Advantage

Pakistan has a competitive edge as it has a strong young and educated workforce already entrenched in global IT markets. Giving them training and support within the organization and policy encouragement to develop AI with complementary skills would make Pakistan more competitive, and the value of the IT services it provides to the world would increase. The danger is that with AI, higher paying, more skilled roles are going to others, with fewer opportunities and pay. The alternative is that these will be able to find jobs in other countries where skilled workers will be paid more and offered better opportunities.

6. Conclusion

This research's findings offer insights into the future of IT jobs in Pakistan across the spectrum of automation, productivity gains, skill changes, and wage disparities. For the majority, it is likely to be a change of employment rather than the loss of employment. Work will change. Skills needed will evolve. Wages will be more differentiated. Job insecurity will increase even if the employment rate does not fall significantly.

The result is not guaranteed, however. Pakistan has an alternative to take: proactive investment in human resources, purposeful organizational strategies to make use of AI and train human actors, and a change in the educational system to provide training for workers in the future. Pakistan has an alternative to follow: invest proactively in human resources, develop organizational practices needed to leverage the use of AI to train human actors, transform the educational system to train workers in the future, and support measures to ensure that the burden of transition does not fall on any particular group or community of people. The studies by Brynjolfsson et al. (2023), Acemoglu and Restrepo (2019, 2020), and more recent ones (2024, 2025) all confirm that such investments are highly beneficial for the competitiveness of countries, for outcomes of workers, and for sustainable technological adoption.

Pakistan has quite a bit of capacity in the IT industry. It can live again if it is carefully adapted, people are learning continuously, organizations invest in people, and governments provide enabling environments. In fact, it is a possibility! It is time to act now. Finally, it is Pakistan's decision..

Author Contributions

All authors participated in ideation, development, and writing the manuscript. All authors read and approved the final manuscript.

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Informed Consent

Informed consent was obtained from all participants prior to data collection. Participants were informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time without any consequences. The confidentiality and anonymity of respondents were guaranteed throughout the research process.

Data Availability



The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request. The authors are committed to transparency and will provide detailed methodological information and analysis protocols upon request.

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