

CHAPTER I

INTRODUCTION

1.1 Background of the Study

The intelligence that once existed as the exclusive property of human beings is increasingly being embodied by advanced artificial intelligence (AI). Abilities such as learning, reasoning, problem-solving, perceiving, decision-making, data processing and interpretation, pattern recognition, comprehension, and adaptation were once regarded as the unique features of naturally evolved human intelligence, limited solely to Homo sapiens as wise creatures. However, as these capacities have begun to manifest in entities beyond the human domain, the remaining sense of exclusive ownership over intelligence has gradually shifted from humans to external systems now identified as AI.

Even unicellular organisms, though simple, exhibit a rudimentary type of intelligence by using tentacles to find food and defend against threats an early dimension of awareness in the animal kingdom (Shanta, 2015). As evolution continued, multicellular organisms developed and developed ways of seeking nourishment and self-preservation and evolved more advanced features such as parenting, breastfeeding, and emotional expression. Nevertheless, none have reached the intellectual level observed uniquely in human beings.

Intelligence emerged fully in Homo sapiens, setting them apart from all other species. Within this context, the knowledge and application of tools constituted the foundation of the cognitive revolution (Harari, 2011). The wisdom associated with humanity was rooted in the intelligence that enabled the conscious use of external tools in daily life, marking the defining symbol of human intelligence.

Throughout history, human societies have relied upon tools and technologies, and each society has adapted tools and technologies in different fashions. This adaptation happened with a great deal of assistance from human cognitive changes, as Harari (2011) observed. Humans are very dependent on technologies, even if they rely on effective human cognition. The cognitive revolution established Homo sapiens as an advanced species on Earth and with it offered a turning point in the evolutionary path of this species. Specifically, Hands (2018) suggested the objective world dictates intelligence, arguing to assess human development must involve both cognition and the

notion the social world offers, based on the individual's relationship to external or material conditions. Harari further indicated a world of external objects logically & materially worked with and against the cognitive revolution and suggested tools played an obvious part in the new cognitive revolution. He argued next that cognition progressed toward advanced technologies, starting with major technological innovations of the Agricultural Revolution (Harari, 2011) dating back almost 12,000 years ago. Hence, human history is at root a record of change in technological environments, where each new phase of interaction between material conditions, intelligence, and social transformations begins to establish every new phase of social life relations.

The Agricultural Revolution was the turning point in human history that established the connection of labor to the process of production, thereby establishing human settlements and centers of growth based on agriculture. The Agricultural Revolution, as it is popularly conceived, signifies the beginning of labor-based production and also the systematic use of tools. Over time, labor-based production along with tool technology progressed into technology as tools. The Agricultural Revolution was commonly followed by the Industrial Revolution, which reinvented labor as mechanized. As Marx (1867) explain that in manufacture the revolution in the mode of production begins with the labor power; in modern industry it begins with the instrument of labor. This historical process has succeeded in gradually liberating humans from manual labor. In the current era of automated work, labor is liberated through reduced human participation in traditional labor. In this context, three types of labor physical labor, mental labor, and skilled labor are facing increasing risks of replacement through advanced automation, questioning the future of labor.

Physical labor is manual work involved in producing a service or product. Mental labor is any act of cognition as a part of production. Skilled labor uses specialized knowledge to produce goods and services. Society's production processes have historically relied upon these three forms of labor. The employment of human labor in societies can be divided into three stages of development. The first was physical labor. It developed along the increase of agricultural production when humans moved from subsistence base survival to structured production processes. Physical labor is about to enter a new stage, as production is mechanized in the First Industrial Revolution. The second stage is mental labor. The cognitive revolution (Harari, 2011) enabled substantial development in the use of mental labor and advances with many

disciplines such as mathematics, science, logic and the automation of cognitive processes began with the Second Industrial Revolution and will continue with the Third Industrial Revolution. The third stage involves specialized knowledge. The concepts of creativity, artistry, and emotive expression have separated Homo sapiens from all other species for a long time. As a social species, operating collectively comes with advantages, but AI is already inhibiting some of those benefits even in artistic and creative venues, indicating more potential fronts that can lead to anxiety about the future roles of humans in the world.

The quest for labor efficiency has long dictated the creation of tools and technologies, leading to the development of AI. Today, AI is generally understood in two types: rule-based and expert systems. Rule-based AI relies primarily upon human interactions, which then support human decision-making. Expert AI generally shows more autonomy and can "do the job" differently than a human, which indicates higher intelligence. Any innovation can make human life easier and better by solving more and different problems, improving productivity, and increasing productivity. Increasing productivity, in turn, enabled human beings to move away from subsistence-level production to producing a surplus of goods, which became the foundation of modern employment.

The researcher can trace the development of work throughout history in stages of creation, replacement, and displacement, with technology as the primary force affecting that evolution. Although the evolution of technology, as demonstrated by AI, has produced new work, it has also replaced old work. From the original developments in the 1950s to now, with ChatGPT-4 and Google Gemini even more recently, AI has evolved through these stages. The historically significant development of language models (LLMs) and advances in machine learning and deep learning point to the possibility that machines might someday outperform humans and possibly diminish human occupation altogether. In the past, physical and mental labor seemed to be the main targets of technological change; skilled labor was still relatively safe from the threat of displacement. However, AI developments are targeting skilled labor at an unprecedented rate and truthfully, we don't yet know how to deal with that unique challenge or the anxiety of maintaining employment.

The fast development of AI has prompted considerable discussion about its effects on both labor markets and our system of society. Historically, humans have relied on labor as a means of living and ensuring some degree of social equilibrium.

Previous technological revolutions created new opportunities that allowed individuals to offset disruption, but with the rapid expansion of AI, the patterns of displacement have exponentially increased. Economies predicated on employment in particular are increasingly unstable, as traditional roles are being phased out faster than new opportunities become available. While previous technological revolutions allowed for adaptive stabilization in multiple domains, the sophistication of AI poses a risk not only for unemployment in labor markets but also for the potential for social disruption.

1.1.1 Artificial Intelligence

AI refers to intelligence embedded within technologies created by humans, distinct from the natural intelligence observed in living beings. Among all species, only *Homo sapiens* possess this advanced form of intelligence. However, with the progression of science and technology, the concept of intelligence has expanded beyond human confines, raising the possibility of intelligence manifesting within human-made systems (Russell & Norvig, 2021). Ultimately, consciousness similar to that of human beings is now considered possible for development beyond humans, within machines. This suggests that in today's technological era, the emergence of machine consciousness is becoming increasingly conceivable.

AI seeks to replicate the cognitive abilities inherent in the human brain through technological constructs. This form of intelligence, sometimes characterized as "alien-level intelligence," incorporates mechanized attributes that may include human-like or even superior qualities such as knowledge, perception, and, in some conceptualizations, emotion (Kurzweil, 2005; Bostrom, 2014). As such, AI represents a sophisticated evolution of intellectual capacity within technology, capable of matching or surpassing human cognitive abilities (Tegmark, 2017). Gradually, human consciousness, once considered exclusive to human beings, is now increasingly perceived as a phenomenon that may also emerge within machines. As a result, consciousness previously limited to and safeguarded within human beings appears to be shifting away from human exclusivity and extending into artificial system.

1.1.2 Employment

Employment refers to the process where individuals engage in production activities through the application of labor to fulfill the demand for goods and services, receiving wages in return. As human development progressed, people utilized their

labor to produce goods, engaging in three types of labor: physical, mental, and skilled. Upon performing such labor, individuals receive compensation from the employing entity, which they can then use to meet other personal needs through the wages earned.

Thus, employment involves individuals offering their labor to an organization in exchange for wages, representing the value of their work. Over time, the nature of employment and the valuation of labor have evolved. Labor performed without payment cannot be classified as employment.

1.1.3 Conflict

Humans engage with themselves and their surroundings in both harmonious and disputatious ways to fulfill their needs. The condition where needs are met through conflict signifies the emergence of conflict. When conflict is confined within an individual, it is termed internal conflict, also known as psychological conflict. Conversely, conflict that arises externally is referred to as external conflict. Both internal and external conflicts can manifest in society, often leading to what is termed social conflict, involving the participation or influence of one or more individuals.

In the process of social development, conflict appears to be inevitable. The sequence of conflict has driven society forward, enabling significant progress over time. As these transformations occurred, new possibilities and challenges emerged within society. It is evident that the tools developed during that period played a crucial role in managing these dynamics and preserving emerging opportunities. Such time-bound conflict is shaped by society, historical context, and evolving needs, aligning with the conditions and environment of the time. Conflict does not remain identical across all contexts; rather, it persists continuously, though its form and nature may differ.

1.1.4 Artificial Intelligence and Employment

The initiation of labor for production can be traced back to the agricultural revolution, where humans relied on manual labor in order to enhance productivity. As human labor alone proved insufficient to meet growing production needs, external tools were introduced to ease the labor process. Simple tools like pointed sticks, spears, hoes, and plows eventually evolved into complex machinery, significantly advancing production methods. In the contemporary world, this progression has culminated in the adoption of AI, which is increasingly replacing traditional forms of labor.

AI has removed physical, mental, and skilled labor, previously the sole domain of humans. Tasks that were once considered exclusive to human creativity are now being challenged by AI's capabilities. Today's AI can perform tasks comparable to human cognition, raising concerns about its implications and challenges. AI has begun to execute tasks beyond human ability, demonstrating superior efficiency and contributing significantly to goods and service production.

The medical field, in particular, has seen substantial integration of AI, enhancing patient care, laboratory processes, and other routine operations. The relationship between AI and employment has thus expanded, with AI bringing improvements in task performance quality on the one hand and displacing human jobs on the other. Despite this displacement, AI's use is becoming indispensable, especially in tasks that humans cannot perform, which underlines its increasing significance.

As AI continues to develop as an essential tool, it simultaneously poses a significant challenge by exacerbating unemployment. Its growing indispensability in performing tasks unattainable by humans highlights its potential and the challenges it brings. Consequently, AI is regarded as both an opportunity and a challenge, reflecting its dual role in improving productivity while raising concerns about job displacement.

1.1.5 Artificial Intelligence, Employment and Social Conflict

AI refers to the intellectual capabilities created within technologies developed by humans, distinct from the natural intelligence found in living beings. Among all species, only *Homo sapiens* have possessed this level of cognitive ability. However, advancements in science and technology have extended the concept of intelligence beyond the human domain, making it feasible within human-made systems. AI replicates the cognitive functions of the human brain within technological constructs, sometimes referred to as alien-level intelligence. This form of intelligence incorporates human-like or even superior attributes such as emotions, knowledge, and perception, representing an advanced evolution of intellectual capacities within technology.

Employment involves individuals participating in production activities through labor to meet the demand for goods and services, receiving wages in return. As human societies developed, labor evolved into three main types: physical, mental, and skilled. Individuals performing these forms of labor receive compensation from employers, which they use for fulfilling various personal needs. Employment, thus, is the process

by which individuals sell their labor to an organization in exchange for wages, representing the value of their work. Over time, the nature of employment and the valuation of labor have changed, with unpaid labor not classified as employment.

From the perspective of social conflict theory, the relationship between humans and the environment is bound to be marked by cooperation and conflict in the struggle of individuals and groups to satisfy their varied wants. As a structural and relational process, conflict is in how these needs are being met, particularly in conditions of power, access, and opportunity. This psychological conflict, when it is internalized in the individual, becomes psychological conflict, and the other side of the coin arises as social conflict. Human conflict can be said to arise from good and bad, different from social conflict. When there's conflict between protagonists, it means that there is conflict of interest, values, culture, or resources. They can happen on different scales of conflict in homes, in communities, in nations, and across the world. Interest groups are unified and reflect deep-seated inequalities and battles for supremacy, for justice, and for recognition.

Importantly, it is important to remember that although all struggles have conflict components, not all conflict is detrimental. Controversy, in social life in particular, helps push forward change, opposition, and evolution. However, in its unacknowledged form or as its meanings are used by those in power, conflict is frequently constructed in a negative way. The nature and scale of conflict are mediated by historical, cultural, and structural specificities, which should give consideration to conflict not simply as violence but as an inherent reality and site of relevance for revealing the endemic aspects of social existence.

In the intersection of AI, employment, and conflict, the integration of AI in the workforce poses significant implications. As AI continues to displace traditional forms of labor, particularly in roles requiring physical, mental, and even skilled work, it leads to shifts in employment patterns. These shifts can trigger social conflict, as the displacement of labor challenges the existing employment structure and creates conflicts within society. Thus, the study of AI, employment, and conflict involves understanding how technological advancements impact labor dynamics and societal stability.

1.1.6 Artificial intelligence, Employment, Social Conflict and KMC Hospital

Setting

The use of AI in private hospitals is steadily increasing, enhancing the quality of services and support patient trust in these institutions. At KMC Hospital, the implementation of robotic services and advanced machines such as the 64-channel MRI has led to an increase in the number of patients seeking care. AI has enabled the hospital to serve a larger number of patients in a shorter time, creating demand for new types of workers while replacing or displacing some existing roles.

Initially, the hospital had a higher demand for workers due to the limited scope of services. However, as services expanded, the number of employees decreased proportionately, while the reliance on AI increased. This trend indicates a growing dependence on AI, which has led to various forms of conflict. Displaced workers have raised concerns and initiated protests, focusing the conflicts caused by job losses. This situation also suggests a psychological conflict among employees, as skilled workers face uncertainty regarding job security.

Hospital administration appears to favor AI over human labor for service provision, reflecting a shift toward a new hospital structure centered on AI technology. This transformation in hospital operations and workforce dynamics presents both challenges and opportunities, underscoring the need to explore the implications of AI's integration into healthcare services.

1.2 Statement of the Problem

Across history, technology has supported human labor by organizing labor processes. The advent of AI adds to the valuation of labor as the automation of tasks that were previously limited to human activity transforms our frameworks of labor (Marx, 1867). This thesis considers the influence of AI on employment and the role it plays in creating societal conflict, along with the consequences of an uncertain future of work.

Technological development has reached a point that causes serious contemplation about the future of human beings. Unlike other forms of technology that require human control, AI can take control on its own and can develop other AIs with a high degree of sophistication. The self-replicating nature of AI runs counter to human

supervision and remains one of the more abiding and critical issues in the current technology discussions.

For most of history, there has been no species that has exhibited cognition comparable to human cognition, with such intelligence even possibly conceived to be alien. Now, AI is checking any exhibited "alien intelligence" rapidly surpassing human capability (Harari, 2024). So, this causes the important sociological questions of what does this all mean for society, how does AI positively and negatively impact society, and will society accept or embrace this "shape-shifting" of humanity's social structures?

This thesis examines AI's impact on employment at KMC Hospital, Nepal, where rule-based and expert systems operate across eight sectors. It analyzes job creation, replacement, and displacement, highlighting resulting societal conflicts and future challenges in managing work amid increasing technological integration within hospital settings.

Employment creation involves generating new opportunities through technological innovation, equipment installation, and evolving systems that demand additional manpower. This process requires training, reskilling, or workforce development, ensuring adaptability to changing environments. Any initiative expanding jobs or enhancing employee skills constitutes employment creation within contemporary labor dynamics.

Employment replacement refers to altering or substituting existing jobs due to technological, organizational, or skill-based changes. It occurs when workers adapt through reskilling, roles transition to advanced competencies, or new employees with updated qualifications are hired, collectively redefining workforce composition and replacing traditional functions in response to evolving demands.

Employment displacement refers to the removal of workers due to technological advancements that reduce reliance on human labor. Automation and machinery can render traditional skills obsolete, making workers' expertise redundant. Such innovations decrease workforce demand, as tasks previously requiring human oversight are now efficiently performed by machines independently.

Conflict in employment arises from disruptions to established workforce norms, often due to technological advancements or new job opportunities. Such changes can render existing skills obsolete, generate unemployment, and create conflicts between

traditional expertise and emerging demands, highlighting the mismatch between workforce capabilities and evolving labor market requirements.

Certain jobs are created as AI reshapes existing knowledge and requires reskilling in various fields, while others are replaced by higher-level manpower or new knowledge, marking a shift in traditional employment paradigms. Moreover, AI is displacing workers by installing new technologies with different trends in AI technology, such as rule-based and expert features, significantly affecting employment across sectors. However, alongside these advancements come challenges, including critical theories suggesting that AI's influence extends into aspects of daily life such as gender, class, race, and caste, potentially leading to societal conflict or harmony depending on its utilization. Therefore, understanding AI's evolving role in society is crucial for comprehending both current and future employment dynamics, a central focus of this thesis.

The thesis explores the growing impact of AI on employment and societal structures, highlighting significant research gaps regarding AI's long-term implications in the hospital setting of KMC. Scholars emphasize the uncertainty surrounding AI's integration into labor markets, noting trends in job creation, replacement and displacement, and reduced human involvement in production. The automation of sentient-level AI was concerning because of unemployment and economic instability. The thesis also reflects on the limitations of traditional Marxist frameworks in explaining AI socio-economic shifts by developing the latest technology. Focusing on KMC in Nepal, the research aims to analyze how AI affects localized employment dynamics and contributes to broader societal transformation, advocating for deeper inquiry into the future social order shaped by AI in the context of Nepal, particularly the KMC hospital setting.

1.3 Research Questions

- (i) What are the different forms of artificial intelligence utilized within the hospital setting, particularly at KMC Hospital?
- (ii) How does the implementation of artificial intelligence influence employment within KMC Hospital?
- (iii) What are the impacts of AI applications on the creation, replacement, and displacement of employment opportunities and conflicts at KMC Hospital?

1.4 Objectives of the Study

- (i) To describe the types and forms of artificial intelligence used in the hospital setting of KMC Kathmandu.
- (ii) To investigate the effects of artificial intelligence on the employment status of the employee within the hospital setting of KMC Kathmandu.
- (iii) To identify the dynamics of job creation, replacement, and displacement and their implications for emerging social conflicts resulting from the adoption of AI technology.

1.5 Significance of the Study

The significance of the thesis on AI and employment lies in its comprehensive understanding of the transformative potential of advanced machines, particularly those employing artificial intelligence. This thesis delves into the complication of AI development, particularly within the context of institutions like KMC Hospital, clarifying the various forms of AI utilized and their functions in employment.

The impact of developed tools and technologies on human life and their role in shaping various dimensions of human existence remain significant. In particular, the emergence of AI in the modern world has influenced job creation, substitution, and displacement, leading to social conflicts. This study examines these effects within the context of Nepal's hospital sector to understand their implications for both the Nepalese environment and global perspectives. Historically, advancements in science and technology have contributed to job creation and substitution. However, the modernization brought by recent technological developments has introduced a new form of job displacement, marking a crucial dimension of contemporary social conflicts. Looking ahead, the continued evolution of these technologies will play a vital role in shaping future societal changes.

1.6 Organization of the Dissertation

In the first chapter, an overview is provided regarding the intersection of AI and employment, discussing the identification of emerging questions, objectives, and the significance of this subject matter. Additionally, the chapter discusses the future implications of AI in employment, considering its relevance in the forthcoming AI era and the potential societal shifts facilitated by AI technology. The current understanding of AI's impact on employment is also explored within the context of present conditions.

In the second chapter, a comprehensive review is presented concerning the historical context, theoretical frameworks, and empirical studies worldwide concerning AI and employment, drawing upon supportive literature reviews to enhance understanding. The chapter further explores the role of AI within emerging societies and the potential conflicts anticipated in the evolving view of AI and employment dynamics.

In the third chapter, the methodology for the entire thesis is developed, encompassing the establishment of both theory and method crucial for the completion of the thesis. The chapter outlines the worldview that underpins the chosen methodological approach. It details the entirety of the thesis process, including the identification of the research field, the formulation of the research design, methodology, analysis, findings, and considerations of ethical aspects, culminating in a comprehensive overview of the thesis methodology.

Chapter four introduces the integration of AI within the KMC hospital, where 119 AI tools, including rule-based and expert systems, are implemented across eight sectors of the hospital environment. The chapter aims to establish the necessity of AI within hospital settings, through empirical data analysis and scenario explanations.

Chapter five analyzes into the relationship between AI and employment, examining its impact on job creation, replacement, and displacement. It examines the utilization of AI across eight sectors and explores how this intersects with employment dynamics, considering the effects of AI on creating, replacing, and displacing jobs within each sector of the hospital setting. Various scenarios of conflict arising from this interaction are also examined throughout the chapter.

Chapter six is divided into four sections. The primary focus is on examining the social conflicts that arise as a result of employment creation, replacement, and displacement caused by AI. In addition, this chapter discusses the role of AI in addressing and resolving such conflicts.

Chapter seven offers a thorough summary, finding and conclusion of the entire thesis, integrating literature review, primary data analysis, and findings to draw conclusions and make recommendations for the future societal view that AI use will shape. It offers a clear depiction of the impact of AI on forthcoming societal structures and dynamics, drawing upon synthesized insights from the thesis's components.

CHAPTER II

LITERATURE REVIEW

During the research process, various articles and writings related to AI and employment from around the world were studied to examine the conflicts they have generated. This study incorporates different dimensions of global research on AI and employment to analyze these conflicts and validate their relevance in the research area.

2.1 Artificial Intelligence and Employment

Around 13.8 billion years ago, scientists theorized that the universe began its formation. Initially, it was an extremely hot mass of molten material. Over time, this mass cooled, eventually giving rise to water, which laid the foundation for life. As Aversa et al. (2016) note, elements like hydrogen, carbon, nitrogen, and oxygen played crucial roles in the development of biological entities. These early life forms evolved, leading to the emergence of more complex organisms. Despite the evolution of organisms, the development of intelligence in creatures was not immediate. Scientists argue that creatures without developed eyes and ears also lacked advanced brain development.

Before the emergence of modern *Homo sapiens*, there existed creatures with human-like appearances but without the developed brains characteristic of humans today. In the course of natural evolution, species resembling modern humans emerged even before the appearance of *Homo sapiens*. However, these species did not attain the same level of brain development as present-day humans. Despite possessing a physical structure similar to that of modern humans, they failed to develop a comparable level of intelligence. Harari (2011) confirms the existence of species such as Neanderthals and *Homo erectus*. The lack of proportional cognitive development in relation to their physical form suggests that, although anatomically similar to modern humans, they were unable to survive in harmony with nature, ultimately leading to their extinction.

Compared to their physical structure, pre-human species did not achieve substantial brain development. According to Divyakirti (2022), these species did not possess brains as large as those of modern humans, with brain sizes averaging approximately 650 cubic centimeters in the head of the skull. This limited brain growth prevented them from evolving the necessary capacities to effectively confront natural challenges. Although their bodies were large, their brains remained relatively small.

Despite being physically larger than modern humans, these species did not have the developed intelligence found in contemporary human beings. This species eventually became extinct, and it is believed that the interbreeding of these early species contributed to the evolution of modern humans.

The current state of humans appears to have resulted from the cognitive revolution that occurred around 75,000 years ago. Among the three species of the Homo family Homo erectus, Homo habilis, and Homo sapiens only Homo sapiens developed the advanced intellectual abilities seen today. This development distinguished humans from other creatures. No other species with such cognitive capabilities has been discovered on Earth. Thus, Intelligence is considered unique to humans, a product of this cognitive revolution.

This revolution provided humans with imagination, intelligence, and memory. Consequently, humans could enhance their creativity, innovate, and pass their accumulated knowledge to subsequent generations something other species have not achieved. However, the development of AI has begun to replicate human-like capabilities. NDTV Profit. (2024). refers to this advancement as the emergence of “Elyon.” In today’s world, AI has begun to exhibit behavior that is markedly different from that of humans, almost as if it belongs to an entirely different realm or plays a role akin to beings from another world. This behavior, which appears purely fictional, focuses the distinct and unprecedented nature of AI’s evolution compared to human capability.

Human evolution has been profoundly influenced by changes in environmental conditions, with early humans initially lacking the brain size seen in modern populations. The remarkable development of human consciousness enabled individuals to learn how to utilize external tools to enhance their quality of life. As human intelligence evolved, so did the capacity to apply tools effectively in daily living. The cognitive revolution, as discussed by Harari (2011), was instrumental in advancing the human brain, allowing humans to distinguish themselves from other species and further accelerate their own development by nature. While such intelligent advancement did not occur in other animals, its emergence in humans is attributed to specific environmental and evolutionary conditions. The human brain is notably large relative to body size when compared to other animals (Chittka & Niven, 2009), which supports the belief that, in humans, brain development significantly outpaced physical growth of

human beings. Consequently, this evolutionary progress enabled humans to integrate external tools into their lives, making their use not only possible but essential for human advancement. This growth underscores the impact of environmental factors on brain development.

For a considerable period, humans have been developing machines, yet the concept of designing machines that can present human-like tasks especially those with attributes like imagination, memory, and intelligence had not been completely envisioned or formally suggested. Only in 1956, at the Dartmouth Conference, did John McCarthy, with his innovative paper, first present the idea of machines having intelligence. This represented a crucial point, as it introduced the notion that intelligence in the machine, previously thought to be limited to humans, might be transferable to machines. The conference therefore turned into a vital moment in the field, starting a period dedicated to creating intelligence machines. Since that time, numerous progressive developments have occurred, and the effort to create such machines persists today.

In contemporary times, machines have come to be operated by software. This software has evolved to a level where it can encompass complex and sensitive aspects such as learning, exploration, emotion, and feeling. Such advancements have created a significant step in the world of intelligent machines, indicating a remarkable leap in scientific research and innovation. In today's data-driven world of information technology, this development has not only enriched itself but has also acquired the capacity for autonomous problem finding. With the convergence of science and technology, the realm of intelligent machines has witnessed extraordinary progress, and this momentum continues to accelerate.

2.2 Detail of Artificial Intelligence and Employment

The increasing global adoption of AI is closely tied to its effects on employment, extensively examined through secondary data analysis in existing literature. This study investigates how the deployment of AI influences global employment dynamics, representing a central focus within the broader research context.

2.2.1 Artificial Intelligence

AI refers to the intelligence that arises in objects created by humans, distinct from naturally evolved intelligence. It is the result of human creativity, where

intelligence similar to, greater than, or lesser than human intelligence is embedded into objects. Humans have reached a point where they can instill such qualities into various entities. Harari (2024) refers to this externally created intelligence as “alien Intelligence,” suggesting that just as humans reproduce successors in their likeness, modern AI can also generate intelligence with similar or different capacities. Harari notes that AI has now reached a level where it can surpass human capabilities, raising the possibility that future AI developments might take on even more formidable forms.

The advancements in contemporary tools have significantly enhanced the capabilities of AI. According to Graglia and Von Huelsen. (2020) the development of technologies such as neural networks, deep learning, statistics, and machine learning has considerably expanded AI’s potential. Recently developed systems like GPT have demonstrated the ability to perform tasks at a human-like level, including understanding and generating language. These systems can even create videos using minimal human guidance, displaying remarkable efficiency. According to Charniak and McDermott (1985), the use of AI has notably increased in fields such as security, research, robotics, voice recognition, and transportation. This widespread application and multidimensional development have significantly impacted various aspects of human life. Nilsson (1961) further highlights AI’s role in research, pattern recognition, learning, planning, and induction. Consequently, AI is increasingly perceived as capable of performing skilled tasks akin to those of humans, suggesting a growing overlap between human and artificial intelligence functions.

The introduction of quantum mechanics in 1922 was a momentous shift in the history of science (Kragh, 1999). Quantum mechanics marks the dismantling of the classical mechanics worldview, revolutionary work started by Niels Bohr and Max Planck, which disbanded classical mechanics’ deterministic theory of motion and ushered in the belief that atomic or subatomic phenomena function probabilistically. Their contribution was not only rich with scientific enterprise, but they also received a Nobel Prize. While the acceptance of probabilistic causality, as framed by quantum mechanics, fundamentally implicates matters of revolutionary progress toward a larger scientific basis for discovery and theoretical avenues of research, it offers even more; quantum mechanics creates a new conception of matter, energy, and causality. The paradigm established by quantum mechanics altered the trajectory of modern physics,

allowing for the expansion of practice in areas ranging from chemistry to related areas of research in emerging technologies.

Kaku (2023) emphasizes that the concept of quantum supremacy implies that Intelligence could potentially emerge from matter, an idea gaining significant attention in contemporary scientific discourse. When considering the dual nature inherent in matter, it can be hypothesized that Intelligence is an intrinsic aspect of matter itself. The double-slit experiment further illustrates this notion; when an observer is present, matter exhibits particle-like characteristics, whereas in the absence of an observer, it displays wave-like properties. This phenomenon lends tangible support to the idea that the question of Intelligence is deeply rooted in the very fabric of matter. Closer to Truth (2020) also posits that the possibility of Intelligence within matter cannot be dismissed. Supporting this view, the theory of quantum entanglement, further explored (Georgieff & Hye 2022) has provided insights into how matter might possess intrinsic properties that enable complex interactions akin to cognitive processes.

McCarthy and Hayes (1981) elaborate that a system demonstrates intelligence if it can resolve problems typically requiring human cognitive effort or navigate intellectually challenging circumstances. The capability of matter to adapt and respond to its environment reflects the fundamental principles underlying human evolution, emphasizing the emerging intersection between quantum mechanics and the understanding of Intelligence.

But Jones (1991) contends that AI lacks the inherent capabilities of human beings, relying instead on human input and resources. The advent of technologies like Neural link has introduced new dimensions to machine learning, presenting systems that, while originating from human innovation, operate with greater speed and efficiency than humans. This represents a significant advancement in AI, embodying features that challenge the boundaries of current understanding. According to Ramesh et al. (2004), the way AI mimics human functionality remains a complex mystery, largely due to the difficulty in replicating human Intelligence. Nonetheless, researchers and computer scientists persist in their efforts to develop superintelligence, which holds the potential to redefine societal norms.

Society is inherently dynamic, constantly evolving through the expansion of knowledge. This ongoing accumulation of knowledge fosters societal transformation,

with continuous practice leading to new insights. The conceptualization of human brain neurons has also encouraged novel ideas, and AI is a direct outcome of this intellectual progression. The impetus behind human innovation is the desire for more efficient access to goods and services, a drive that has catalyzed the emergence of AI. This technology influences all aspects of society, acting as a transformative force in the modes of production, the means of production, and the production relations, which constitute the foundational structure of society. Consequently, the rise of AI suggests that the societal superstructure will undergo significant changes, reshaping the way human beings interact with the world.

2.2.2 Rule-Based AI

As humans began utilizing the tools available in their environment to fulfill their needs, they also started engaging in the processes of production, exchange, and distribution, leading to the invention of machines to increase productivity. Initially, analog machines were created, but as these machines failed to adequately meet the required needs, humans gradually developed automated systems. These automated machines, which included human involvement, can be seen as the early forms of rule-based AI. While human intervention was essential for these machines, it did not require the same level of full engagement as analog systems did.

Rule-based AI systems, commonly referred to as production or expert systems, are fundamental types of AI that employ a set of rules to represent knowledge and guide decision-making in various contexts (Grosan, 2011). Without direct human intervention, these machines cannot perform any tasks. They can only carry out certain actions autonomously under continuous human supervision and direction. For example, in computer-assisted instruction (CAI) programs, such as those used in developing computer graphics CAI courses, production rules are applied to connect system states with program actions (Heines, 1985). These systems, however, cannot operate without human guidance. Only through constant monitoring and instruction can they complete specific tasks.

When well-defined rules are established, rule-based systems are capable of supporting more complex behaviors more effectively than reinforcement learning systems (Orozov, 2021). These systems effectively capture human directives, operating within a framework defined by rules, which instills confidence in users. Moreover, rule-

based AI systems are instrumental in capturing human expertise and automating problem-solving processes, making them both practical and profitable (Hayes-Roth, 1985). They can harness human knowledge and follow instructions while autonomously solving problems. Even though human intervention is involved, these systems are capable of performing a wide range of tasks with greater efficiency than human capabilities alone would allow.

2.2.3 Expert AI

The advanced form of rule-based AI is known as expert AI. In this type of AI, human intervention may be minimal or entirely absent. It refers to AI that can learn from its environment and perform tasks based on various tools it has been exposed to. In expert AI, direct instruction alone is often sufficient to guide the system. Expert systems are computer programs designed to simulate human decision-making processes by resolving complex problems using a knowledge base and a control mechanism (Yaghmai, 1984). These systems, supported by internal tools such as computers, are capable of performing tasks based on their specific characteristics without human assistance.

Rather than replacing human decision-making, expert systems are designed to provide expert advice and assist in decision-making (Yaghmai, 1984). They are developed to be autonomous in the sense that they can access knowledge from various sources in their field and deliver information immediately, without requiring human intervention. These systems have greatly enhanced organizational quality, efficiency, and competitive advantage, and they have been applied across multiple sectors such as science, engineering, business, and medicine (Kaur et al., 2013). The systematic and organized nature of expert systems enables them to execute instructions without human interference.

Expert AI systems are evolving, with computers becoming increasingly capable of performing in various domains. According to Jouppi et al. (2017), expert systems are categorized into several types, including rule-based, framework-based, fuzzy logic-based, and neural network-based systems. The features of the AI system can be further subdivided according to the tasks they perform, their capabilities, and their characteristics. Due to their increased capabilities, expert systems can now be applied to a wide variety of fields. A single AI system can be used across different tasks.

Expert systems typically include software modules that perform inferences and respond to user inquiries, alongside a comprehensive knowledge base (Liebowitz, 1995). These systems are developed and refined according to their specific programs and are capable of performing tasks autonomously. Through their programs, they execute functions that require no human intervention. Recent advancements in AI, such as ChatGPT and Google Gemini, demonstrate how AI systems have evolved to perform tasks with greater capabilities than humans, further enhancing their role in a variety of fields.

2.2.4 Employment

In a contractual relationship, two primary parties are involved workers, who are compensated with wages for their labor, and employers, who may be corporations, organizations, or other entities that invest in or manage institutions to realize profits or losses. Employers provide employment opportunities to workers, enabling them to sustain their daily lives.

Dik and Duffy (2009) highlight that one critical aspect of the meaning of work is the extent to which it contributes to a sense of purpose or meaningfulness. Purpose is defined as a stable and generalized intention to achieve something significant both to oneself and to the broader world. Meaningfulness is conceptualized as “the sense made of and significance felt regarding the nature of one’s being and existence.”

Despite the inherent value of work, workplace discrimination persists, prompting various movements to advocate equal rights for workers. Brough (2020) references the slogan, “Eight hours to work, eight hours to play, eight hours to sleep, eight bobs a day,” which emerged from Melbourne University in 1856. This slogan encapsulated the demands of skilled workers who successfully secured an eight-hour workday. The 19th-century movement advocating a 40-hour workweek underscored human rights, emphasizing the need for a balanced life encompassing work, rest, family, and personal recovery, thus shaping the modern concept of work-life balance.

Labor conditions vary significantly between democratic and socialist regimes. Botero et al. (2004) found that socialist, French, and Scandinavian legal systems generally offer superior labor regulations compared to common-law countries, indicating that political systems play a crucial role in determining labor conditions.

Employment patterns have evolved with the emergence of new states, although these changes are not universally accepted. Technological advancements continue to transform job trends, with artificial intelligence poised to significantly alter traditional employment systems worldwide.

2.2.5 Creation of Employment

The history of automation underscores its dual role in task replacement and the creation of new occupational opportunities. The continuous process of automation has led to the emergence of new roles, particularly in programming, design, and the maintenance of advanced technological systems. These include software and app development, database design and analysis, computer security, and specialized functions within existing roles, such as administrative assistance, loan application analysis, and medical equipment maintenance (Acemoglu & Restrepo, 2018). The advancement of technology continually demands skilled individuals, creating new opportunities in various fields. Each new technological innovation generates additional opportunities, necessitating specialized expertise due to the unique characteristics of these technologies.

As AI advances, its capabilities approach human-level performance, making a wide array of tasks feasible through modern technology. The adoption of AI is rapidly increasing across various sectors, including healthcare, law, education, industry, agriculture, and security. Unlike natural human intelligence, AI excels in computation, data processing, pattern recognition, prediction, problem-solving, judgment, creativity, and communication in modern capability (Acemoglu & Restrepo, 2020). These capabilities reflect areas traditionally occupied by human labor.

AI is not only displacing certain traditional professions but also generating new forms of employment. While AI alleviates repetitive and monotonous tasks, transforming non-routine tasks into routine ones, as demonstrated in empirical studies from developed nations (Gregory et al., 2016), it also plays a crucial role in enhancing ease, motivation, and enthusiasm among workers. By mitigating the boredom and potential decline in quality associated with repetitive tasks, AI contributes to creating a more engaging work environment and fosters the development of new opportunities. Consequently, employees must adapt to these technological changes to remain relevant in future professions (Bhargava et al., 2021). The advancement of technology fosters

the development of professionalism and enhances engagement in work. It contributes to the evolution of advanced work practices and supports the integration of new generations into the workforce.

Although reliance on automation has increased, it has simultaneously enhanced productivity and labor demand without causing widespread displacement (Acemoglu & Restrepo, 2020). Technological advancements in automation do not eliminate the necessity for human involvement; rather, they augment both the need for human labor and the daily requirements of individuals. As human assistance remains essential, the demand for workers, whether in new or existing roles, continues to grow. AI serves as a tool to monitor and improve employee performance, providing insights into behavior that can be used to enhance job quality (Tong et al., 2021). The use of AI surveillance tools facilitates continuous performance improvement, contributing to the overall efficiency and effectiveness of the workforce.

2.2.6 Replacement of Employment

Artificial intelligence, machine learning, automation, and robotics have played a role in replacing jobs with steam engines. The first industrial revolution created a steam engine to remove manual workers from the field of the working place; the second revolution was improved electronics that made job automation; the third revolution emerged with electronics and information that advanced the automation of jobs; and the fourth revolution was a fusion of technology and the development of artificial intelligence or machine learning, which replaced the cognitive level of the job.

Artificial intelligence is replacing manual workers to advance the sense level of the job, which is known as “technological unemployment” or “technological job obliteration” (Wang & Siau 2019). Again, the Economic Forum predicted that by 2020, artificial intelligence will reduce humanity by 5 million jobs, which means that in the future, technological unemployment will create. In that case, high-skilled manpower is required for the artificial intelligence age (Yang 2020, March). Technology is going to advance, so the performance of the machine will need skilled workers; otherwise, the machine will not function.

Additionally, artificial intelligence makes chances for groundbreaking human-machine integration for providing service but also results in a fundamental threat to human employment. First, artificial intelligence has multiple capacities to separate

every sector of the job, such as management, science, and economics, which means it hampers all sectors of the job field. It comes to replace service jobs, tasks, and labor at the root level (Huang & Rust, 2018). Machines have reduced the necessity for human involvement in the workplace. While decreasing human engagement in daily tasks, they have significantly increased production to meet human needs. This has resulted in a decreased workload while concurrently enhancing the accessibility of fulfilling these needs. Brynjolfsson and McAfee (2016) emphasized the escalating impact of technology as a significant force in both professional and personal domains. Modern science and technology appear to challenge the traditional notion of human labor as the primary source of productivity. The ability to perform tasks with minimal or no human involvement suggests a shift in the role of humans in the production process, potentially displacing their traditional contribution to productive power.

Artificial intelligence creates new jobs by shifting the nature of the job. Artificial intelligence replaces many irritated jobs, and humans will engage in interesting job fields, but that is the wrong perspective because artificial intelligence replaces every sector of the job base (Graetz & Michaels, 2017). That means the force of production, means of production, and model of production have been changed to artificial intelligence. As a result, artificial intelligence does not use humans in the production process.

2.2.7 Displacement of Employment

In its initial phase, AI technology replaces traditional workers with those possessing new skills; however, it ultimately displaces workers from the workforce altogether. Initially designed to augment human intelligence, AI eventually surpasses human cognitive capabilities, growing at a rate far exceeding that of human intelligence (Tegmark, 2017). While this displacement occurs, AI's productivity significantly outpaces that of human labor.

Several sectors illustrate this shift, including retail self-checkouts, smartphone applications, automated accounting processes, the Internet of Things, and the emerging development of driverless vehicles. These advancements exemplify how AI displaces employment in related industries (Brougham & Haar, 2018). AI's influence on various sectors is contributing to rising unemployment as it increasingly performs tasks traditionally carried out by humans.

The integration of neural networks into machines suggests that human-level intelligence is achievable within these systems. In such scenarios, human intelligence becomes redundant for the operation of machines with capacities surpassing human abilities (Bostrom, 2014). This technological advancement leads to a substantial reduction in the need for human workers, further highlighting AI's role in displacing human intelligence within the workforce.

2.2.8 Artificial Intelligence and Employment Based Conflict

The convergence of hardware and software during the fourth industrial revolution has led to the development of AI. This convergence has generated new employment opportunities as traditional job roles evolve into more technologically advanced forms. Consequently, AI has facilitated large-scale job creation, although significant transformations in the nature of employment.

AI's proliferation has also sparked conflicts within the employment sector. Notable examples include the dismissal of AI ethics researcher Dr. Timnit Gebru from Google and the resignation of whistleblower Frances Haugen from Facebook, both of which underscore conflicts between corporate interests and employee ethical concerns (Ryan et al., 2024). Emerging research indicates that AI could drastically reshape labor markets, economies, and political structures, potentially causing societal disruptions. Studies have examined the conflicts generating from automation, including the roles of robots, big data, and AI, with a focus on inequality and conflict management across various nations. The economic and political destabilization attributed to AI has been analyzed through interdisciplinary lenses, including political science, sociology, economics, and AI research. Interviews with ten international AI experts across different sectors have emphasized AI's disruptive potential and its impact on domestic conflicts.

Technological advancements have necessitated a shift in the workforce, demanding skilled labor to operate and manage advanced technologies. As a result, traditional workers are increasingly being replaced by those with the expertise to handle evolving technological forms.

Recent advancements in AI, energized by greater data availability and computational power, have found applications across sectors such as healthcare, education, and security (Ulnicane et al., 2021). While AI holds the promise of

substantial societal and economic benefits, its development has introduced significant public debate over issues of power concentration, inequality, and discrimination. These controversies have led to policy-level conflicts, highlighting the importance of governance in diagnosing problems and proposing solutions. Current governance, often dominated by a few large corporations, is frequently criticized for neglecting broader societal needs. To gaining these challenges, there are calls for a more active and collaborative role for the state and society in promoting AI development while mitigating risks and ensuring societal involvement. However, this governance model faces obstacles, including the risk of capture by vested interests and difficulties in reaching consensus. Public engagement is considered a means to enhance diversity, representation, and equity in AI development and deployment, though this governance approach lacks specificity in addressing well-known challenges.

The integration of software and hardware presents a significant challenge for employment, as the nature of machines has evolved to encompass intelligence levels akin to human cognition. In such scenarios, human intelligence becomes redundant for performing many tasks, leading to a substantial displacement of human labor. The rapid advancement of machine intelligence, which surpasses human cognitive speed and efficiency, results in a predominance of machine intelligence in various sectors, thereby reducing the need for human involvement in the workforce.

2.3 Artificial Intelligence and Employment

The evolution of AI and its impact on employment represent an ongoing and continuous series of developments. From historical milestones to the present day, this process has unfolded gradually over time. According to Acypreste and Paraná (2022) The common purpose was to develop a framework able to accurately predict the probabilities of jobs or tasks being totally or partially substituted by machines. The development of machines has begun to exert a significant or partial impact on work. As a result, the necessity of human involvement in various tasks has been displaced. Although this impact may seem limited at present, it is projected to increase further in the future.

Recent advancements in AI have significantly enhanced its scope and capabilities, resulting in a higher potential for displacing human labor compared to previous periods. As Acypreste and Paraná (2022) note, recent years have seen

impressive advances in AI, and this has stoked renewed concern about the impact of technological progress on the labor market, including on worker displacement. Given the evolving nature of these technologies, it appears that in the future, an even greater proportion of jobs may be taken over by AI systems.

In the past, technological tools did not possess characteristics that reflected human nature; as a result, they functioned merely as useful instruments to assist human life. However, in recent times, such tools particularly AI have evolved to the extent that they can now perform aspects of human nature. According to Prentice et al. (2020), emotional intelligence as personal intelligence and artificial intelligence as machine intelligence have gained significant attention in the literature over the past two decades. This development has enabled machines to simulate human emotional traits, posing challenges to tasks traditionally dependent on human intelligence. As humans begin to encounter their own traits replicated in machines (Cortes & Tessada, 2011), the sense of individual ownership over intelligence is increasingly undermined. Consequently, even work previously considered exclusive to human emotional and cognitive domains now appears at risk of being taken over by AI.

The initiation of labor began when humans started fulfilling their needs through work. Over time, this labor became increasingly structured and expansive, eventually evolving into the modern, organized systems of labor management we see today. The development of tools has played a significant role in the advancement of labor. With the introduction of new tools, the demand for human labor in the market increased. Aghion, Antonin, and Bunel (2019) argue that the effects of AI and automation on economic growth and employment largely depend on the surrounding institutional frameworks and policy measures. In this way, the recent development of technological tools has also had a substantial impact on employment.

The development of recent technologies has begun to exert influence across all countries of the world. Most notably, their impact on employment has created new opportunities globally. As Qin et al. (2024) point out, recognizing the significant role of artificial intelligence in the labor market is essential for China's sustainable development. In this way, contemporary technologies are emerging with the capacity to shape not only employment opportunities but also exert influence across multiple dimensions, suggesting an even broader and more extensive impact on the future of the coming generation.

The intersection of AI and employment has been shaped by historical contexts, and this ongoing development has been a recurring theme throughout history. The progression of AI and its implications for employment is characterized by a regular and predictable pattern, as elucidated in this section.

2.3.1 Origin and History of Artificial Intelligence and Employment

The momentum that was initiated with the cognitive revolution was later on amplified by environmental facilities during the use of external phenomena as tools and technology, following the path of humanity's development. This trend toward progress was amplified by the rise of machinery. With the introduction of tools into human life, there was an enhancement in the productivity of goods and services, beginning with the Agricultural Revolution.

The first revolution was between 1760 and 1840, when machines were developed to replace manual labor, such as railroads and the steam engine designed by scientists. However, it was the First Industrial Revolution that truly modernized this process, significantly contributing to increased levels of production and consumption. As Deane (1979) observes, a continuous some would say 'self-sustaining' process of economic growth, whereby each generation can confidently expect to enjoy higher levels of production and consumption than its predecessors, is open only to those nations that industrialize. In this context, the First Industrial Revolution marked a turning point in the development of industry to meet human needs, inspiring new hope among people and bringing about transformative outcomes in production.

Although humans had already begun to harness power through tools, the Second Industrial Revolution marked a significant shift by transforming the very sources of energy used in production (Haenlein & Kaplan, 2019). The invention of electricity made it possible to replace older sources of power, leading to greater efficiency and increased productivity of goods and services. The application of electricity in tools not only boosted output but also accelerated task execution. As Mokyr and Strotz (1998) note, electricity was a domain in which entirely new knowledge was applied to solve economic problems, and its economic potential had been recognized as early as the beginning of the nineteenth century. This innovation brought transformative change to the economy itself. Whereas earlier efforts focused on modifying existing power sources, the discovery of electricity laid the foundation for the Second Industrial

Revolution. It enabled mass production and expanded the possibilities for employment. It was the electrification and hence production line in the second technological revolution in the late 19th and early 20th centuries that was such a revolution not everyone was suddenly as wealthy as Bill Gates, but now it was possible to mass produce.

The third wave of innovation began in the 1960s and is widely known as the PC or digital revolution. It was run by advancements in semiconductors and transistors, mainframe computing during the 1960s, the rise of personal computing in the 1970s and 1980s, and the subsequent development of the internet in the 1990s, all of which contributed to developing software that works to replace mental labor from the market. This revolution enabled machines to perform tasks related to information processing and software functions that were once considered exclusive to the human brain. As Blinder (2006) notes, the inexpensive and efficient global transmission of information has dramatically increased both the volume and diversity of services that can be traded across borders and this expansion is expected to continue. This wave broke traditional boundaries, extending the reach of labor beyond national borders and replacing cognitive tasks once confined to the human mind a transformation that marked a fundamentally new feature of technological progress.

While the first two industrial revolutions primarily displaced physical labor, the latter two have increasingly displaced mental and creative labor. The ongoing Fourth Industrial Revolution, as Schwab (2017) notes, holds the potential to substitute even highly skilled workers. This transformation has encroached upon domains that were historically considered exclusive to human intelligence. Additionally, Ramesh et al. (2004) emphasize that Aristotle begins with right-thinking logic using syllogisms and deductive reasoning to lay the foundation for modern modes of reasoning. The Fourth Industrial Revolution has now challenged this very capacity, previously portrayed as a unique human function. As Xu, David, and Kim (2018) observe, in the first three stages of civilization, manual workers produced most goods and services through physical labor, whereas in the most recent stages, knowledge workers have done so using their minds. What is most striking about this revolution is its demonstration that even cognitive tasks once thought to be the sole domain of the human brain can now be performed by machines.

Consciousness is a wave generated in the human brain it is a phenomenon that emerges from the material structure of the brain, and thus, it is not a supernatural entity. It is a property arising from matter, which has developed in a highly advanced form in humans, unlike in most other species, where it has not reached this level of complexity. As Russell (2010) notes, the Greek philosopher Aristotle, depicted on the book's cover, was the first to articulate a set of laws specifically and uniquely applicable to the rational part of the mind. Philosophers have long explored the possibility that such properties, which emerge in the human brain, could also arise in other material forms an inquiry that dates back centuries.

Within the human body exist specific structures capable of rational thought. In particular, the left hemisphere of the brain is responsible for logical reasoning a function that emerges from matter itself. Similarly, Aristotle devised a structured form of syllogism to guide correct thinking, theoretically allowing conclusions to be mechanically derived from initial assumptions. It was only much later several centuries afterward that the notion emerged that a mechanical device could perform meaningful reasoning, as seen in the work of Ramon. Today, machines have advanced to the point where they can operate at a similar level of reasoning, despite also being composed entirely of material substance.

The emergence of intelligence from the material structure of the human brain is not a strange phenomenon; rather, it is considered a result of specific circumstances that made such development possible. The potential for this kind of intelligence to arise appears to have existed long before its actual manifestation. As Hobbes believed, if reason were like numerical computation, then the brain's capacity to add new information and retain it for future use was what fundamentally distinguished humans from other species. In a similar way, humans envisioned the possibility of storing and processing new information in external material systems, much like intelligence operates within the human mind. As Nidditch (1968). noted, we add and subtract in our silent thoughts. By that time, the automation of computation was already well underway a concept that had been practiced and theorized long before it became technologically feasible

Since the beginning of time, researchers and inventors have been focused on building machines that operate in a manner similar to human cognitive states (Russell & Norvig, 2021). The initial challenge was the replication of human abilities such as

imagination, memory, or the ability to think, next as they would function in a mechanical configuration. Starting from the 1500s, Leonardo da Vinci tried to build a mechanical calculator. He did not succeed; restoration work shows he would have been able to create a mechanical calculator, as it was theoretically capable (Kemp, 2006). Regardless of these early failures, these innovators paved the way for a new technological pathway, shaping the development of machines, specifically the activities that require human-like levels of function.

In human history, the long-standing aspiration to create a machine embodying human-like qualities was finally realized after considerable effort when, for the first time, a device was successfully built that possessed the capacity to perform tasks associated with basic intelligence. According to Buchanan (2005) around 1623, Blaise Pascal constructed the first and most well-known mechanical calculator. Pascal remarked, the arithmetical machine effectuates a series of results that seem to exercise intelligence, even if it is gained from and exceeds the surrounding actions of animals. This invention marked a remarkable milestone in human life, guiding society toward a new and transformative path.

Gottfried Wilhelm Leibniz built a functioning robot that could perform operations about thoughts, as opposed to numbers, but it was rather simplistic. Leibniz did improve on Pascal, making a calculator that could add, subtract, multiply, and take roots, while Pascal's could add and subtract only (Buchanan, 2005). Others speculated that machines would not only compute but also think and act on their own. In his 1651 masterpiece, *Leviathan*, Hobbes proposed the concept of an "artificial animal" and went on to argue that "for what is the heart, but a spring; and the nerves, but so many strings; and the joints but so many wheels, giving motion to the whole body?" That the mind works at least in some regards by following logical rules and assembles physical systems to run at least a few of these rules. That's one thing to say; it's another to say the mind is just such a physical system.

Descartes was the first to explicitly separate mind from matter and the first to encounter the problems associated with the matter of the mind. The only problem with a strict, entirely physical definition of the mind is that it doesn't leave a lot of room for free will. If your mind is determined by nothing more than the laws of physics, then there is no free will, unless a rock has free will to fall downward toward the center of the world. Descartes was a strong supporter of the power of reason to make sense of

the world, a belief we now call rationalism and to which Aristotle and Leibniz also belong. But Descartes was a dualist, too. He asserted that there's a neighborhood of the human mind that is outside of nature, free of physical laws. But animals have no such duality; they may be handled as machines. Another one is materialism. That the brain's working according to the laws of the body is mind. Free will is just how the experience of available options looks to the choosing system. So, we have a physical mind that processes information; now, where do we get the data?

It is a sentiment that reiterates that of John Locke: Nothing is in the intellect that wasn't first in the senses. The movement known as empiricism, as founded by Francis Bacon in *Novum Organum* 2, was putatively birthed and distinguished by Baconian proclamation. David Hume argues in his treatise on the nature of attributes that people come to know a general rule when they think of a group of their associations coming in the habit of repeated association of two terms.

The program of positivism was most credibly formulated and defended by the celebrated Vienna Circle, directed by Rudolf Carnap, on the basis of various contributions by Wittgenstein and Russell. This theory assumes that knowledge is frequently outlined by some logical system, eventually linked to observation sentences that reflect sensory experience; therefore, positivism contains both a body of rational knowledge and knowledge through empirical research. Cf., for example, the theory of confirmation of Carnap and Carl Hempel, who sought to study the processes by which data is acquired through experience. Carnap's (1935) book *The Logical Structure of the World* formalizes a certain computational algorithm for distilling knowledge from primitive experiences. Perhaps it was one of the first theories of mind as computation.

Newell (1982) placed in their GPS program Aristotle's algorithm after 2300 years. Now, we might describe them as a regression planning system. The price-theoretic analysis is useful, but it does not say what you should try to do when there are multiple actions that will achieve the goal or no action that will achieve it in full. Antoine Arnauld accurately characterized a quantitative rule for determining which course of action to demand in instances such as this. The book *Utilitarianism* (1861) by John Stuart Mill is one of the classic expositions of a consideration of all forms of happiness in an act. The precise theory of selections is a more formal topic. The more rigorous theory of selections is treated below.

It was said the other day that the history of technology is the history of economic revolution. The major tech revolution is training the office worker of tomorrow, the newly educated desk jockey. The AI and jobs are time-dependent on historical analysis. For the history of technology and, thus, work, it works to, most importantly, see the truth of the history to which the work is to be appended (Frey & Osborne, 2017). Although the typewriter was patented in the 1860s, the device did not appear inside the office until the early 1900s, entering an era of mechanization that included Dictaphones, calculators, mimeo machines, and address machines, and so the forerunner of the PC (Frey & Osborne, 2017). The invention process was easy in its first stage, in which the machine presented itself simply; now it is complicated and effective enough for all work.

This thesis summarizes the history of AI intellectually. This kind of history is also adjunct to the quality history of a science in its accumulating content, and therefore scientists are responsible for discoveries and developments (Newell, 1982). There's no extra for it. Thirdly, the role of AI, especially when produced by the sector rather than by the historian, is obscure. So far, the picture such history paints are intriguing. This thesis, of course, is not historiography, yet it functions as a primary document by a participant in the field.

2.3.2 Theoretical Review of Artificial Intelligence and Employment

Artificial intelligence recently became a new metascience that attract the eyes of the researchers. The world has researchers working on various aspects of artificial intelligence. And so, all over the world, researchers draw on a variety of theories to understand artificial intelligence and what it could mean for society.

AI and quantum computers are also getting better at investigating the structure of the human body down to atomic detail. As Kaku (2024) observed, AI programs such as AlphaFold have mapped the intricate atomic structures of some 350,000 different kinds of proteins, one of them being the entire repertoire of proteins that form the human body. The progress in AI development is gradually advancing to a level where it can perform highly similar functions akin to those of human beings. Just as proteins play a vital role in generating intelligence within the human body, the evolving trajectory of AI suggests that similar functionality may eventually be replicated in artificial systems. This has opened up new possibilities within the field of AI, where the concept of

consciousness at the genetic level is now beginning to emerge as a significant area of inquiry.

Painting accurate pictures at a microscopic level of tissue or organ of the body. This is a powerful example of how AI will drive the microscopic study of the human body. Those capabilities promise to lay the groundwork for new advancements in human anatomy and biology, leading to a better understanding of complex physiological systems and how to treat them as an autonomic level.

Social environments continually transform as new entities become perceived as threats to the current state of social organization. New things govern society in this state. McCarthy and Hayes (1981) cite the idea of using simulation of the theory of natural selection with intelligence to mutate computer programs in a suitably challenging situation. There are many problems in society that we cannot solve by human effort and AI is helpful for controlling social phenomena. Report Khanal (2020) suggested that complex historical data on human trafficking can be easily analyzed using machine learning and artificial intelligence solutions, which may lead to the solution of the problem. AI has the ultimate power to address social issues, and will be able to cope with every single social problem in an efficient way.

IBM's Watson computer to produce chronic care and cancer treatment guidance based on big medical evidence reports as well as other legal and financial services, is another non-routine task (Frey & Osborne, 2017). AI can save patients from doctors when it comes to the medical field and it can certainly be used to treat patients in terms of assisting in data networking. Leveraging the increasing access to healthcare data and the rapid evolution of analytic skills, it represents a transformation in healthcare. the actual position of AI in health care systems and talk about AI applications that can improve health on different kinds of we can apply AI in health care data (structured and unstructured) (Jiang et al., 2017). Popular AI techniques include machine learning methods for structured data and natural language processing for unstructured data. applications in stroke, in the three major areas of early.

One of the latest and most potent advances in health care is precision medicine that enables early interventions (based on advanced diagnostics) and treatments customized for better and broader population segments. Medicine is also characterized by its demanding requirements to analyze the full body of patient data that, in turn,

makes it challenging to put healthcare information to use in practice decisions. Some existing limitations have been mitigated by technological developments (Ahmed, 2020). In order to realize an effective and actionable precision medicine that represents a new stage in our understanding of medicine and health, which will take into account individual differences in people's genes, environments, and lifestyles, as well as the identification of new opportunities transcending the computing and information technology limitations of the past, we need to take advantage of the opportunities brought by big data for data integration and collective wisdom, feedback within feedback, and we must make the data accessible to those facing the dark side of society (unemployment).

Ernst et al. (2019) argue that technology is the challenge and the opportunity for the future of work. Throughout history, technology has shaped and reshaped the work we do. The nature of work had changed with the rise of technology in the first industrial revolution. Technology is indeed replacing low-skilled work, but the progress is now hitting highly skilled work in the working field. In addition, Shan, Miao and Lian claim that artificial intelligence results unemployment. So, do machines have a human faculty that substitutes for the blue-collar worker down here in the field of work, as Herbert (1956) also contends? Furthermore, Shan et al. (2020) propose that industrial intelligence significantly affects employment. The work of the hand in the workplace is replaced by the industrial revolution, and the work of the mind in the workplace is dismantled by artificial intelligence.

Society is entering into the job hole that exists in society. Shan et al. (2020) hold that the development of artificial intelligence has saved labor time and labor costs, untied the worker from soil and earth, and left many workers unemployed. The knowledge base is also replaced from the working population which divides the labor force. Labor on the other hand is under the surveillance stress. Mirjafari et al. (2019) adopt technology that tracks the worker for enhanced performance in the work environment. Phones, wearables, beacons, or backend servers are used for mobile sensing for tracking the worker and get optimal output from the worker. Furthermore, the workplace is made essentially as a multi-dimensional phenomenon that demonstrates the efficiency with which employees, and more generally staff, work, the inventive strategies which they use, and their creativity in facing problems.

Meanwhile, artificial intelligence lands on the economy of society. Furman and Seamans (2019) make the case that AI is heavy-weight in the economy. On a range of measures, from robotics shipments and A.I. startups to patent filings, there is ample evidence of a sharp uptick in AI activity. We also summarize recent research in this realm, which indicates that artificial intelligence and robotics could deliver productivity-enhancing gains but may have mixed effects on labor, especially in the short term. Some jobs and industries could do fine while others face labor market disruption. Then, we consider current and potential AI-related policies that could spur productivity gains and mitigate any harmful effects on the job market. These measures include whether to create a specific AI regulator, to do more to promote antitrust enforcement and a range of other policies for managing the impact of AI on the job market, like a universal basic income and guaranteed employment.

It's the things that technology makes possible that is also making employment so interesting. Nawaz (2019) mentions that recruitment could be processed efficiently by artificial intelligence type without involving human. It's also a large tent of computer science also used to do decision-making analytics, pattern recognitions like visual and spoken, and translations between languages. But the hiring process is only one small slice of AI. AI fills jobs so we can serve. Employees can submit employment applications directly by the Internet also in attractive branches. Else the owner recruits the staff for his or her school without advertising in other media. However, Lu et al. (2018) argue that AI has had an impact on social and economic life. Both developed and emerging countries are investing in innovation in weak-to-strong AI.

In today's world, AI is more widely accepted as a component for streamlining activities and enhancing productivity. Van et al. (2020) have pointed out AI's capacity to process enormous amounts of data within a time span of seconds reflects its disruptive force in both strong and weak AI reality. This evidently shows that AI is a function that can be engaged across various elements of life. In this light, positivist positions are often adopted to probe the relationship that AI has with jobs, as researchers are able to use observable data and measurable variables to describe the changes within labor markets (Frey & Osborne, 2017). Alternatively, Huang and Rust (2018) explain that AI is not merely an incremental advance in technology but a transformative one that can shape and subsequently change the character of the workplace and the work we do.

This positions AI as shaping change from a structural standpoint in society. Moreover, Liu et al. (2018) describe AI as a boundary issue; we can say that they are beyond being circumstantial, as there will always be extra economic considerations (silver linings) and cultural, ethical, and political considerations, which would impact the subject matter. The positioning of all the above represents that AI relates to human activity in various ways that present opportunity and uncertainty, which require consideration and adaptation.

AI is fundamentally about augmenting and improving the productivity of people's labor in both material and intellectual spaces as well as improving the intelligent capabilities of machines to enhance human capabilities. Beyond this, AI includes advancing artificial systems into the performance of environmental creation, societal management, and finally, the integration of humans and machines into a social system. Here, the balance between job stability and technological development represents greater power relations and, in particular, how societies will divide the rewards from technological advancement (Frey & Osborne 2017). With these dynamics comes critical complexity around issues of fairness, access, and the redistribution of resources.

Positivism provides a successful way to interrogate the relations between AI and the progressive divergence of work in both developed and developing countries. This methodology also allows us to systematically explore the implications of the structure of labor by identifying both routine manual work and the non-routine cognition work that is increasingly numeric and is pursued by AI-based innovation (Ge et al, 2018). As the rate of technological progression has reached a tempo that is faster than ever throughout society, with its impact now touching on almost every field of work, AI provides for much more than a technological transition but rather represents a fundamental change in how we organize labor, productivity, and society.

Research explanations can also be examined within the framework of Marxist theorizing using the methodological approach of positivism. The framework of Marxist theory offers a valuable perspective for research undertaken on production and social change. For instance, while we employed a qualitative method in the study, it also used a positivist framing to systematically interpret the dynamics of production. In Marxist theory, elements such as force of production, mode of production, means of production, and relations of production serve as central categories for understanding social

transformation (Marx, 1867). Marxism fundamentally asserts that capitalism is a culmination of the struggle of class, final because class contradictions within capitalism will effect change in response to those contradictions.

According to this premise, the aspect of production is changing based on contradictions that result from technological innovation in the form of methods of production. Small-scale or local production represents various possibilities for social transformation that favor the public good over private accumulation. Finally, the intersection of positivist methodology and Marxist theorizing provides additional critical understandings of how technology positions work and production, as well as social relations, in a temporally evolving process of social change.

The first industrial revolution replaced physical labor, while the second and third industrial revolutions replaced mental labor, and the fourth industrial revolution will reorganize skilled labor in the workplace (Rifkin, 2014). Artificial intelligence is the hallmark of the fourth industrial revolution and is one of the main tools shaping the transformation of employment.

Life exists in three modes: biological evolution, cultural evolution, and technological evolution. Life 2.0, on the other hand, can reconfigure much of its software: humans can acquire complex new skills that get rated, like language, sports, and professions; one can estimate views and doorways. Life 3.0, still not present on earth, has not only the ability to rewrite its software but also its hardware too, to a good extent, rather than merely evolution causing such gradual change (Tegmark, 2017). ‘The technology is so cheap also, so it is low-cost production due to the technology. In this model, production becomes automatically possible, cheap, and sufficient for whatever and in whatever way people want for them (Rifkin, 2014). Technology has a new capacity to ensure a good life, but the control of the technology is limited, which causes a crisis in society.

AI undermining surplus value: The theory of the production and destruction of surplus value against the theory of production values and AI production as non-production of needs or use-values. The boss uses cheap labor and sells high-priced merchandise (Marx, 1867). The remaining price of goods minus wages as surplus value, accumulated as capital, caused the class-division between owner and worker. AI is directly undermining the current suction and meanwhile aiming at the marginal cost of

zero of society with the support through the AI (Rifkin, 2014). The Science has been globalized. The invention is not any one's by right of discovery, it belongs to the world. Thus, the owner's investment is gradually drying up itself in the form of automation which indeed becomes a problem of production, of consumption, of conflict, of the social transformation.

2.3.3 Empirical Review of Artificial Intelligence and Employment

The development of artificial intelligence and employment is constructing a new social system. Modernization is possible through the development of science and technology. Artificial intelligence has an impact on and implies every society. Artificial intelligence is used in every sector of production, which is why the utilization of human power is decreasing in all sectors. Therefore, unemployment or a new social system will emerge in this changing context.

Artificial intelligence is developing into singularities and superintelligence (Aghion et.al, 2019). The level of development of artificial intelligence is higher than that of human intelligence. So, it performs at a higher quality than humans as a superintelligence. The non-routine cognitive task is easy to perform with artificial intelligence in the latest condition of technological development.

The utilization of technology is helping to transform society from one state to another. European society is developing because of the use of technology. Primitive society changed into a slave society. Slavery society changed into feudal society, and feudal society changed into capitalist society. This is an ongoing process; therefore, a new society will emerge through the development of technology.

Studies on Artificial Intelligence:

New opportunities are emerging in the field of AI with the recent progress in quantum computers. It has the potential to treat complicated and severe diseases by understanding their nature in a deeper sense than conventional digital computers. For instance, through DNA genomics, computers can recognize genes, e.g., BRCA1 and BRCA2, which are linked to the susceptibility of breast cancer. But it remains silent for digital computers as to exactly how these defective genes cause cancer and how to fight cancer when it spreads to other parts of the body.

They may find new drugs and therapies to fight these diseases, and quantum computers that are now under development can analyze the molecular detail of the

immune system (Kaku, 2024). Thus, the developed quantum computers can be used for finding diseased cells in the body and treating them without affecting other cells. Additionally, it can help in treating diseases like cancer, Alzheimer's, Parkinson's, and ALS with high precision and thus enhance the level of medical treatment.

Different sectors of society adopt artificial intelligence. Legal processes, medical treatment, invention, art, literature, and construction use the latest technology to update the sector belief that is a case build that creates, in addition, art part of the general recruitment processes in Bangalore and Hyderabad (Nawaz, 2019). However, the Pew Research Center shows that 63% of participants were hopeful about artificial intelligence because artificial intelligence would augment humans in the job field, despite some researchers fears that artificial intelligence would pose a threat to society. In other words, if artificial intelligence is possible, it will build a technological singularity that will help create superintelligence. Superintelligence will become possible before 2060.

Dwivedi (2019) In the manufacturing sector, the World Economic Forum predicted that artificial intelligence would replace 20% of jobs in the UK but 26% of jobs in China and India. On the other hand, the new probability is that artificial intelligence will create 133 million new jobs globally by 2022. Admittedly, artificial intelligence is growing as an ability of humans in 2075, which is superintelligence, a challenge for humanity. Additionally, artificial intelligence is defined as mimicking cognitive functions with human attributes, such as learning, speech, and problem-solving. Other experts view artificial intelligence as their interpretation of achieving specific outcomes by using external data via flexible vision.

According to researchers Ernst et al. (2019), over the next 20 years, technology may displace 35% of all workers in the United Kingdom and 47% of all workers in the United States. The displacing rate is regularly increasing in developed countries. According to the World Bank (2016), the rate of job risk in developing countries is 69% in India, 72% in Thailand, 77% in China, and 85% in Ethiopia. Otherwise, artificial intelligence gives developing countries the chance to develop at a low cost and grow productivity with technological support. Furthermore, Agrawal et al. (2018) argue that artificial intelligence is the capacity of machines to make predictions using large amounts of data to take actions in complex, unstructured environments.

Wang et al. (2020) found that technology has affected huge numbers of the population in China, which creates unemployment and challenges economic and social development. In addition, the rate of unemployment in China (5.5 in 2019) is lower than in the world and is lower than in low-income countries. The rapid development of technology and its impacts on employment is a popular research topic (Frey & Osborne, 2017; Acemoglu & Restrepo, 2017; Obeidat et al., 2017; Moriuchi, 2019). Ke & Wei (2004) believe that one-quarter of jobs are computerized in Singapore. Michaels and Graetz (2015) suggest that robots increase productivity and wages, minimizing employment among less-skilled workers. However, Dettling (2017), conversely, identifies that broadband had no significant impact on unemployment. Nina-Estrella (2014) argues that internet use is more demanded by women in the workforce.

Vazquez and Winkler (2017) find that the internet lifted employment by bumping the number of part-time and homeless workers. Still, using limited methods to prove unemployment is the limitation of this research. Likewise, Wang et al. (2020) still use limited methods to prove unemployment, which is the limitation of this research. The positivist approach, on the other hand, is based on quantitative data, such as the coefficient matrix, the spatial econometric method, a model showing industry spillover, and Moran's I test methods. 56% of industries in 43 countries are the sample of the research. Overall, technological advancement will usher in a new global economic and social order.

Hamaguchi and Kondo's (2018) development of artificial intelligence and robots is replacing human labor in a different regional area in Japan. The development of artificial intelligence and robots impacts a huge number of workers. A male worker is less affected than a female worker, as shown in the 2010 survey report. Although the development of technology helps mitigate unequal risk between workers, Jones (1991) says that artificial intelligence does not appear to have quality, but it depends on database knowledge. Artificial intelligence retrieves the information with the support of the entry data. Like a medical disease or a train, the arrival time may depend on the previous data. Additionally, Lu et al. (2018) explore how the utilization of artificial intelligence is increasing daily. A narrative science survey found that 38% of enterprises had been using artificial intelligence in 2016, but that number is increasing to 62% in 2018. IDC estimates the 2017 artificial intelligence market will grow 300% more than in 2016.

Studies on Employment:

The nature of employment has evolved over time, with different historical periods giving rise to varying forms of work. European societies, in particular, have witnessed the development of distinct employment types, including physical, mental, and skill-based labor, which have persisted from earlier times into the present (Marr, 1977). Some tasks have been automated, removing the need for human labor, while others remain routine manual jobs. The employment sector now comprises a mix of non-employment roles, routine cognitive tasks, and non-routine jobs (Ge et al., 2018), all of which continue to shape the labor market.

The effects of AI on employment differ between developing and developed countries. In particular, the integration of AI into the workplace has gained traction in developing countries such as China, where the prevalence of cognitive workers has increased steadily from 1990 to 2015 (Guo & Wang, 2020). In contrast, in developed nations, the introduction of advanced technologies, such as the assembly line by Ford, has significantly reduced labor costs and overall work time by approximately 34 percent (Frey & Osborne, 2017). According to Buera and Kaboski (2012), there is a growing demand for skilled workers across various employment sectors, resulting in higher wages for these employees. Moreover, the workplace environment itself plays a pivotal role in shaping employee outcomes, as highlighted by Abubakar (2019), who suggests that while working conditions may be favorable, the actual results can vary.

In the context of healthcare, Ramesh et al. (2004) argue that AI has the potential to revolutionize medical services by offering efficient and accessible healthcare delivery, positioning AI as the “medical intelligence” of future clinicians. As a result, human doctors may not be as essential in hospital services, with neural networks enabling rapid dissemination of global health knowledge, thus simplifying the provision of healthcare in both developing and developed countries.

Technology has changed the way of work, and in many ways, it is making human jobs less important. AI is already causing job losses, and the next big leap in AI, called quantum AI, is likely to make this problem worse (Executive Office of the President, 2016). The researcher needs to understand how AI affects jobs, as it is a complicated issue. On one hand, AI creates new jobs that require high skills to manage

and maintain these advanced technologies. On the other hand, it automates many tasks, which can lead to job losses and rising unemployment. However, AI also makes services more efficient. This shows that the relationship between AI and jobs is constantly changing and depends on many factors.

2.4 AI, Employment and Social Conflict:

Throughout history, humans have sought to distinguish themselves from other living beings. As the human physical structure alone proved insufficient for their circumstance, individuals began to use external objects as tools or weapons. This marked a turning point in human development, allowing them to surpass other species in shaping and controlling their difficult environment. The Cognitive Revolution (Harari, 2011) played a crucial role in this transformation of humans from the other species with developing brains.

In this context, Marx (1867) observed that while production initially began with human labor, the technical mechanization of labor eventually alienated humans from the process of production. This alienation laid the foundation for the development of modern machinery, which in turn displaced a significant portion of the labor force. The result was a growing divide between capital owners and workers, giving rise to class struggle.

Marx (1867) emphasized that “in manufacture, the revolution in the mode of production begins with the labor-power; in modern industry, it begins with the instruments of labor. Our first inquiry, then, is how the instruments of labor are converted from tools into machines, or what is the difference between a machine and the implements of a handicraft? We are only concerned here with striking and general characteristics, for epochs in the history of society are no more separated from each other by hard and fast lines of demarcation than are geological epochs” (p. 260, para. 2).

Contemporary technological advancements have further deepened this divide, intensified socio-economic inequalities and reinforced the structural conflict between the ruling and working classes.

In recent times, the generative AI model Deepseek, which has created a significant buzz, has had a considerable impact on the U.S. economy, presenting new global challenges. With lower investment costs, Deepseek has demonstrated greater

effectiveness and capability than other advanced generative AI models, further intensifying global competition. The CEO of Google even accused the Chinese Deepseek of data theft, which escalated into a verbal conflict. This controversy not only increased conflicts but also led to severe financial crises for OpenAI and Google. The situation has provided a clear depiction of the potential conflicts that may arise from AI advancements in the future.

The advancement of AI has gradually diminished human utility in various job sectors. Today, AI is capable of designing more efficiently than humans, driving cars with greater precision, and providing superior surveillance and security (Zuboff, 2020) through AI-powered cameras. Its application in healthcare has expanded significantly, enabling machines to perform tasks that even human doctors cannot accomplish with ease. The use of AI in radiology, particularly in advanced data analysis, has further validated its capabilities. Additionally, AI requires only a one-time investment, often at a lower cost, and can operate without human intervention. As a result, AI is increasingly offering superior services while gradually displacing human workers from various fields.

The long-held belief that AI, a human invention, could never surpass human intelligence is now being challenged. As Zuboff (2020) states, that science finds, industry applies, man conforms, reflecting the historically active role of humans in technological advancements. While AI was initially seen as a tool controlled by humans, its rapid development now reaching the level of DNA (Zuboff, 2020)-based modifications and approaching sentience has raised concerns about the erosion of human Intelligence as an exclusive trait.

This shift marks the beginning of an inevitable conflict between humans and AI, a conflict that is expected to intensify as AI becomes even more advanced in the future. As civilization progresses, this technological evolution is likely to escalate global conflicts for the human-centric approach. A proper analysis of this phenomenon, grounded in objective reality, is essential. Only by refining our understanding and adapting to these changes can humanity maintain its relevance in the evolving world; otherwise, the future appears to be one of increasing conflict.

2.5 Artificial Intelligence and Employment from The Perspective of Conflict, Peace, and Development Studies:

AI plays a pivotal role in shaping modern society, influencing a wide array of sectors such as communication, healthcare, production, distribution, consumption, transportation, education, and social functions. As an integrated system, AI mirrors human behavior, creating a complex interrelationship between human and artificial societies (Cipresso & Riva, 2015). This integration is essential for optimizing societal operations across various disciplines, ensuring efficiency and high performance. For example, machine learning and natural language processing can aid in addressing prejudices and disparities within the legal system, thus facilitating broader access to justice (Stern, 2018). Consequently, AI is an indispensable tool for the social construction and functioning of modern society.

From the perspective of conflict, peace, and development (CPD), AI's multifaceted nature is increasingly relevant. Conflict remains a persistent global challenge, manifesting at both micro and macro levels (Mäki, 2020). At the micro level, technological innovations have the potential to unintentionally create conflicts within personal and familial contexts, thereby complicating interpersonal relationships and leading to social discord.

On a macro scale, AI technologies, especially autonomous weapons, pose considerable risks to global security and stability, particularly with the potential for misuse by technologically advanced nations (Surber, 2018). Recent advancements in destructive weapons, traditionally controlled by humans, have raised concerns. According to Harare (2011), if AI progresses to the point where it can develop destructive weapons independently, it could operate beyond human control, leading to catastrophic consequences. This scenario highlights the perilous implications of AI warfare and the risks associated with the unchecked use of state power in such a context. This duality underscores the complex role AI plays in both facilitating and exacerbating societal conflicts.

On the other hand, AI contributes to the process of peacebuilding by addressing human needs and identifying sources of conflict. By leveraging its analytical capabilities, AI can aid in resolving complex social challenges, thus fostering peace (Mäki, 2020). In this context, AI becomes an essential tool in maintaining social

harmony, helping to fulfill human necessities, and mitigating potential sources of conflict.

The fourth industrial revolution, driven by AI, marks a significant milestone in societal development. AI accelerates the availability of knowledge, enhancing data processing capabilities and computational power, which in turn facilitates progress across various sectors. This transformative process contributes to sustainable development, particularly through poverty reduction and improvements in infrastructure reliability, such as transportation, thereby promoting economic growth in emerging economies (Mhlanga, 2021). AI also streamlines marketing and logistics, making goods delivery more efficient in terms of time, cost, and accuracy, leading to global market expansion.

In conclusion, AI is reshaping society by influencing conflict dynamics, promoting peace, and driving development. When properly harnessed, AI has the potential to transform society in a way that fosters peace and sustainable growth, ultimately contributing to a more equitable and advanced future.

2.6 Research Gap

The rapid advancements in AI and its growing influence on employment dynamics have led to various perspectives on the future implications for both the workforce and societal structures. The research gap in AI and its relationship with employment remains significant, especially regarding how AI might shape future labor markets and economic systems. Scholars such as Shan et al. (2020) emphasize the uncertainty surrounding societal existence following the integration of AI, focusing on it as a critical area for future research in the existence of intelligent machines. The presence of AI has led to the unification of science and technology after the mid-20th century, signifying the convergence of hardware and software as Life 3.0. This fusion has introduced tools into society that differ fundamentally in nature from those of the past, signaling a transformation in the very fabric of social experience.

Likewise, Wang and Siau (2019) highlight the challenges posed by AI in shaping future societal structures, particularly in terms of the quality and adaptability of AI within social frameworks. Addressing the gap between AI and society, these scholars suggest that this issue will be resolved over time, though the precise implications remain uncertain. Similarly, Wang et al. (2020) argue that technological

development, including AI, will lead to a redefined global economic and social order, marking another key area for further investigation. As a crucial aspect of society, the economy particularly employment is increasingly influenced by the recent advancements in AI, which have the potential to alter not only the structure of employment but also the very nature of production by changing the force of production. This transformation has become a central concern in contemporary society.

Mirjafari et al. (2019) underscore a crucial research gap by pointing out that while technology increasingly monitors workers, it simultaneously has the potential to replace them entirely. This transition between monitoring and displacement in the workplace calls for an in-depth exploration of the evolving role of AI in labor markets. Yang (2020) also acknowledges the connection between AI and employment but notes that the long-term consequences for future societies remain neglected in current studies. In order to understand today's society and seek suitable solutions, the emergence of AI has become inevitable. The changes it has brought to employment make the study of these transformations an essential academic pursuit, one that appears crucial for arriving at a deeper understanding of present-day realities.

Huang and Rust (2018) add that while the development of AI is progressing rapidly, its impact on employment trends, especially concerning job displacement and transformation, remains insufficiently studied. Liu et al. (2018) assert that AI has already emerged as a transformative force in the global economy, indicating that future research should further explore its implications across various sectors of human activity. The production power, once limited to human hands, is gradually being diminished with the advent of AI.

It appears that human labor encompassing physical, mental, and skilled work is increasingly being displaced, leading to a detachment of humans from the productive forces that once defined their role in the economy. Ernst et al. (2019) similarly emphasize the necessity for a more comprehensive understanding of AI's economic and social ramifications, particularly regarding how these advancements will transform labor markets and employment practices. As human participation in all production processes continues to diminish, the changes introduced by AI in the current societal structure seem poised to unveil a new vision for the future society.

The rapid rise of automation powered by AI has restructured labor markets by limiting human involvement in an increasing number of tasks. Recent developments, especially in generative technologies such as the recent explosion of the GPT series illustrate the extent to which machines are able to perform tasks requiring advanced cognitive capacities and even emotional reasoning and non-culpability. Clearly, this broadened automation capability transforms the landscape of automation and the associated disruption of employment.

The increasing use of, and reliance on, AI tools will further disrupt and reduce human work, and estimates suggest this trend will continue with negative growth of employment and terms of employment. Such changes lead to important questions about unemployment, underemployment, and overall socioeconomic limitations of job displacement. The replacement of skilled labor by AI systems deepens a research void, principally, the ways that technological advancement undercuts the conventionality of human labor. Relatedly, academic and policy interest is also turning towards the imminent implications of new technologies such as quantum AI, where fast-tracked worker displacement may consolidate employment into profound structural challenges (Frey & Osborne, 2017). For this reason, research and analysis of the implications of AI and the future implications of AI on labor markets remain necessary to address the evolving relationship between technology and work.

While the existing literature addresses these global trends, this study specifically focuses on the creation, replacement, and displacement of employment within the context of the Kathmandu Medical College (KMC) hospital in Nepal. The integration of AI in healthcare and its potential to reshape the workforce at KMC presents a unique research opportunity to explore the localized impacts of AI on employment dynamics.

The intersection of AI with broader socio-economic concepts presents a significant research gap. As AI increasingly creates, replaces, and displaces jobs, it drives shifts in production, consumption, and societal conflict. The advent of automation challenges traditional Marxist frameworks, as the balance of power between employers and employees is undergoing significant change. The automation of production processes is diminishing the potential for exploitation by transferring control over labor to machines.

This dynamic has the potential to disrupt the traditional model of capitalist production, where inequality is often exacerbated by the scarcity of goods and services. With the rise of AI automation, the availability of goods and services may increase, thereby reducing societal inequalities. In contrast to past technologies, which were limited in their scope and application, the emerging, advanced forms of AI today are increasingly challenging capitalist power structures. Recent technological developments, once confined to the hands of capitalists, now appear to be undermining their control, further shifting the power dynamics in society.

In addition, AI offers the possibility of mitigating societal conflicts, as automation can fulfill human needs more efficiently and equitably than traditional systems. This raises questions about the relevance of Marxist theories in the context of contemporary technological advancements. As societal structures evolve in response to AI, the potential for conflict may diminish, leading to a more peaceful and equitable society. The transformation of the economic base, driven by technological advancements, suggests that new forms of social systems, such as scientific socialism, may emerge, further challenging traditional ideological frameworks.

Given these developments, the need for new research on the evolving nature of society, employment, and technological advancement is critical. This research gap calls for an exploration of the future social order that will emerge in response to AI, particularly in terms of its ability to resolve existing societal problems. Thus, my research aims to address this gap by focusing on the implications of AI for employment and its potential to reshape social structures, both globally and within specific contexts such as the KMC hospital in Nepal.

2.7 Conceptual Framework

Human development has been deeply reliant on external resources, as humans lack inherent physical attributes for combat, making them comparatively weaker than other animals. This reliance has driven the evolution of tools, from basic machines to sophisticated AI systems and supercomputer AI, which are now seen as the latest advancements in technology, resembling human-like machinery. The emergence of AI has sparked significant debate regarding the potential of technology to surpass human capabilities. A crucial area of focus is understanding human interaction with AI systems and narrowing down the role of humans in the future of employment. Key aspects of

this interaction include the division of labor, trust, control, and accountability in human-AI collaborations, which are essential for predicting AI's impact on labor markets and societal structures.

AI's growing role in human affairs signifies a shift away from direct human intervention in technology's functioning. This transition raises questions about the implications for employment dynamics, especially regarding job creation, displacement, and shifts in the demand for skills, as well as its broader effects on social inequality. Critical AI theory serves as the foundation for examining these issues, particularly in the context of surveillance capitalism, where AI controls vast amounts of personal data.

Furthermore, the examination of labor market dynamics including job creation, displacement, skill requirements, and wage inequality becomes pivotal in understanding how AI will shape employment patterns and influence broader societal trends. The socioeconomic implications extend beyond the workplace, influencing income distribution, social mobility, job quality, and access to AI technologies.

This thesis adopts a conceptual framework in which AI variables are considered independent, while employment is seen as dependent. This perspective aligns with the research methodology, guiding the investigation into the complex relationship between AI, employment, and societal conflict while acknowledging the inherent limitations and evolving nature of knowledge in understanding these phenomena.

2.8 Design of Conceptual Framework

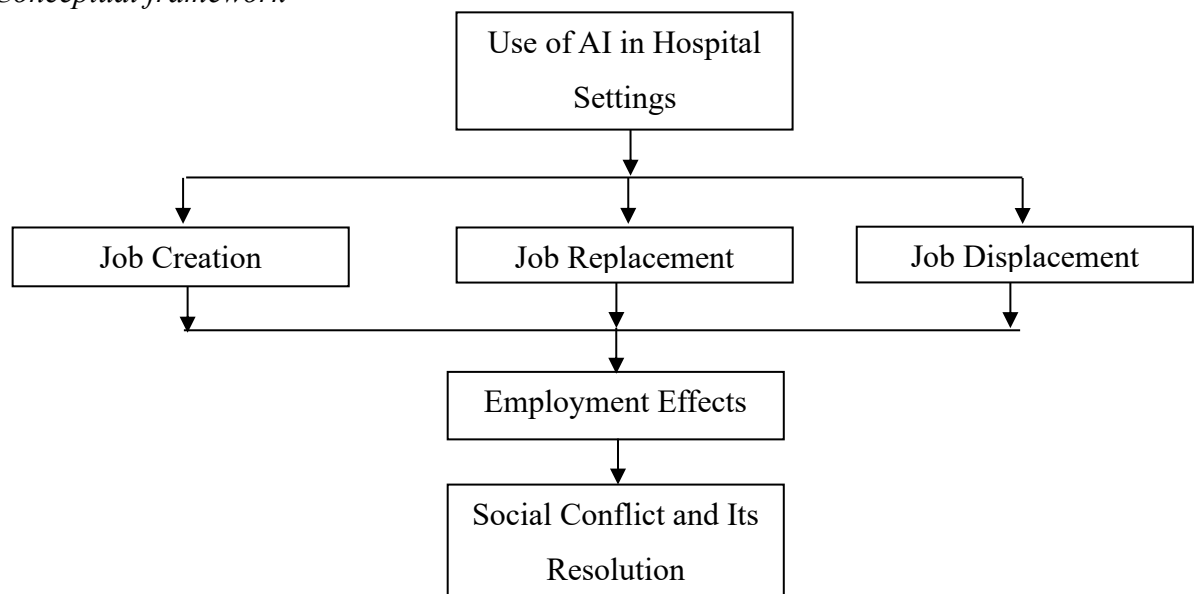
The development and implementation of AI technologies involve processes that impact employment through creation, replacement, and displacement. As AI systems are integrated, these processes can lead to conflicts between the creation of new jobs, the replacement of existing roles, and the displacement of employees. Such conflicts contribute to broader societal conflicts, which are managed through various mechanisms as outlined in the framework provided below.

AI is contributing to job creation while simultaneously demanding new skills, rendering older skills obsolete and leading to the displacement of workers. This dynamic process not only creates new opportunities for those with the requisite capabilities but also replaces and displaces those with outdated skills. Consequently, conflicts arise within this framework as the workforce navigates the transition. While

efforts are made to manage these disruptions, the nature of contemporary technology raises questions about the sustainability and duration of such management. Historically, technology has played a pivotal role in shaping human employment, presenting both opportunities and challenges. From the physical labor shifts of the first industrial revolution to the mental labor transformations in the second and third, each wave of technological advancement has reshaped employment in the present. In the current era of the fourth industrial revolution, even skilled workers are subject to cycles of job creation, replacement, and displacement, leading to significant implications for social structures and societal conflict as people adjust to the rapid pace of technological progress.

Figure 2.1

Conceptual framework



Source: Developed by Researcher

Thus, the conceptual framework shows the multidimensional ramifications of AI adoption in relation to hospital work arrangements. In the framework, there are three primary employment effects that AI adoption produces: employment creation, employment replacement, and employment displacement. Employment creation occurs with the introduction of new AI-related roles that enhance work efficiency and technical expertise. In contrast, employment replacement occurs when AI-mediated systems displace parts of a worker’s job traditionally performed by a human person, reducing the livelihood of some workers (with increasing tension) in the workplace.

Finally, employment displacement occurs when an AI-mediated system completely replaces a position; this creates significant stress, resistance, and insecurity in staff. These employment effects contribute to conflict organizationally and socially, taking form as disagreements between staff, low job satisfaction, and resistance for staff working with the latest technologies. All of the employment effects of AI adoption have mitigating factors in the conceptual frame of the paper, which may either reduce or increase organizational conflict (e.g., training for new technologies, communications, and adjustability). Ultimately, the model demonstrates that AI in healthcare can be both positive and disruptive it can drive modernization while also disrupting previously established employment arrangements, which may lead to new coping and conflict negotiation strategies to ensure equitable and coherent integration.

The conceptual framework employed in this thesis parallels the operational structure of Kathmandu Medical College (KMC), located at 184 Baburam Acharya Sadak in Sinamangal, Kathmandu, Nepal. KMC provides a comprehensive range of medical services, accommodating 900 beds in both general and cabin settings. The hospital's extensive facilities include intensive care units, coronary care, neonatal intensive care, major and minor operation theaters, and various diagnostic services such as CT scans, ultrasounds, treadmill tests (TMTs), pulmonary function testing, and endoscopic procedures.

With nine operating rooms, including one for emergencies, KMC ensures prompt and efficient surgical care. Since 2021, newly established operating rooms for OB/GYN and neurosurgery have further expanded its capabilities. Specialized clinics in areas such as cardio-diabetic care, well-baby care, hemophilia, and childhood asthma, along with other super specialties, enhance the hospital's service offerings. The collaborative efforts of the healthcare, pathology, radiology, administration, security, housekeeping, driving, and pharmacy departments ensure comprehensive patient care. KMC operates 24/7, integrating healthcare and education through its affiliated college.

Incorporating AI into eight departments, KMC demonstrates the evolving relationship between AI and employment, necessitating scientific inquiry to uncover objective truths and reduce biases in variables. This framework explores the socio-cultural and power dynamics shaped by AI, adopting a multi-perspective approach that includes rule-based AI, expert AI, and the employment dynamics of job creation, replacement, and displacement. This critical perspective addresses biases and

assumptions inherent in research, contributing to a comprehensive examination of the socio-technical system. The analysis informs the understanding of conflict, peace, and development within current and future societal contexts, highlighting the transformative impact of AI on employment and social structures.

CHAPTER III

RESEARCH METHODOLOGY

This thesis attempts to offer a framework from the perspective of the developed theories to date. While each theory was inadequate to address certain aspects, it became increasingly evident that none could fully encapsulate the entirety of the subject matter. This limitation is articulated through the explanation of the ensuring theories.

Positivism is a methodological approach that provides a theoretical foundation for the pursuit of pure science. It is grounded in the belief that only objective reality observable and measurable phenomena can be acknowledged as valid knowledge. The new (Minsky, 1961) approach is typically applied in contexts where laboratory-based testing is possible, and it is primarily used for the discovery of truth through empirical investigation as re-verification.

Once a truth has been tested and verified through observable evidence, it is regarded as an established fact remaining unquestioned until a more objective truth emerges to replace it. Supporting this perspective, Fox (2008) states, Positivism has been widely applied in the natural sciences, where empirical observation is used to generate theories and models that can be generalized. This approach rejects non-observable (and hence untestable) sources of knowledge as unscientific. In this way, positivism continues to serve as a theoretical foundation for the search for natural truths.

Because of these limitations, positivism has faced considerable criticism since the early development of social science. Over time, it has been largely replaced especially in qualitative research by post-positivist perspectives on knowledge (epistemology) and reality (ontology). From a post-positivist point of view, the pursuit of knowledge remains central, but the idea of uncovering a single, absolute truth is seen more as a guiding hope than an achievable endpoint. Rather than aiming solely to explain phenomena in objective terms, post-positivist inquiry often prioritizes understanding an understanding that is always shaped by specific contexts and conditions in the social phenomena. Additionally, post-positivism recognizes the active role of the researcher in interpreting data, emphasizing the need for reflexivity throughout the research process.

3.1 Post-Positivist Approach

In the context of today's global village, science and technology have played a pivotal role in shaping the modern world. Technological advancements have developed tools that can traverse vast distances quickly, effectively transforming Earth into a small, interconnected world. The invention of flight by the Wright brothers made rapid air travel possible, while developments in information and communication technology enabled the swift exchange of information.

According to Kaku (2023) as Google CEO Sundar Pichai observes, just as the invention of flight marked the beginning of a new civilization, the recent advancements in quantum computing and AI are believed to herald the dawn of a new era. These advancements have not only brought convenience to human life but have also facilitated the emergence of international conflicts through technologies like AI.

For analyzing conflicts emerging from such technological foundations, a post-positivist approach appears to be highly suitable, as it allows for a nuanced understanding of the social implications of these advancements.

In *The Logic of Scientific Discovery* (2005), Karl Popper introduces the post-positivist approach, highlighting the importance of scientific methodology in understanding societal phenomena, particularly the impact of technological advancements on employment dynamics. Popper argues that technological changes permeate every aspect of social structure, influencing job creation, replacement, and displacement. His work advocates for the post-positivist approach as a valuable philosophical tool for analyzing the intersection of technology and society.

This framework enriches scientific methodology and serves as the philosophical foundation for this thesis, especially in exploring the effects of AI on employment within the social sciences. However, it fails to address the social conflicts arising from these technological advancements. While Popper's framework discusses the technology-driven changes in society and the conducive environment it creates, it does not provide insight into the conflicts generated by these changes, nor does it offer solutions or envision the future societal impact of technology.

Although the positivist approach was initially applied in the domain of pure science, it was sociologist Max Weber who introduced its relevance to the field of sociology. Weber emphasized that social phenomena should not be understood purely

through an objective lens, but rather through a subjective perspective that considers the meaning individuals attach to their actions. As Fox (2008) explains, Weber's concept is the recognition that social realities need to be understood from the perspective of the subject, rather than that of the observer, and in totality rather than in isolation. The social perspective will be studied as a subject through this approach.

Since social phenomena are both experienced and enacted by individuals, Weber argued that they can and should be studied through a sociological lens. This perspective opened the door for the application of sociological inquiry into various dimensions of human life. Over time, such an approach has influenced a wide range of methodological frameworks. As noted by Fox (2008), These elements have been highly influential in the development of social science research in the twentieth century and underpinned the development of movements including symbolic interactionism, social constructionism, and feminist and postmodern approaches in the social sciences. Thus, with its expansion across diverse sociological traditions, Weber's foundational ideas have also contributed to sociological investigations of emerging, science- and technology-based subjects in contemporary society.

The study of conflict, peace, and development falls within the realm of applied science and usually connects with pragmatism. And John Dewey's theory on the societal effects of technological employment in terms of job creation, replacement, and displacement supports this point and encompasses an understanding of the effects of science and technology on employment (Nyabuto & Wabwoba, 2024). The identification of post-positivism as a possible philosophical alignment under the umbrella of idealism adds further relevance to the complexity of this process. However, not only does pragmatism apply as a theoretical approach, but it also does not address the conflict and societal implications directly related to conflict-fueled employment pressures or conflicts. Given that the theory does not include the technology of today, it has no merit for analyzing the thesis or knowing it from its perspective.

The primary research question and aim of this thesis are closely connected to the postpositivist approach acknowledging existing conditions and accommodating these conditions' ongoing appropriateness. The research is primarily with applied sciences, specifically conflict, peace, and development studies; all are informed by a pragmatist perspective and some form of critical theory. Critical theorist Juergen Habermas argues that advances in technology can be fundamentally disruptive and

reinvent social structures that can lead to fundamental change to social groups. In addition, the theories surrounding failure rejection and automated AI logic can explicitly critique implications of AI for employment and social implications. However, in the course of developing these theories about technology, and compared to the current technology of AI, the course of society changed. Older technologies only focused on jobs that were made and replaced, yet much of the new technology is leading us to lose jobs. As this shift is not recognized through the theory, it is not possible to continue the thesis from this position.

This thesis directly connects critical theory and its implications and applications to AI and employment specifically and surveillance capitalism. This research gap investigates how developments in technology influence employment conditions to explore both the creation of new roles in labor and displacement of roles in labor. The critical theory framework facilitates the analysis of the complex relationship between AI and employment and exposes further implications of technological change for society. Even with this theoretical grounding, a critical lens proved to be only useful to a limit for looking at the various conflicts that developed with advances in AI and employment in society; therefore, it was not able to develop the thesis only from a perspective of this theory.

Due to the inherent limitations of my methodology and the boundaries defined by the previously mentioned theories, I found that they were unable to fully encompass the entirety of my thesis and subject matter. As a result, I have made an effort to guide my research within a conceptual framework. When no single theory could fully encapsulate my topic and methodology, I proceeded to advance my thesis through this methodological approach.

The post-positivist approach plays a significant role in linking subjective reality with society and transforming it into a subject of inquiry. This is particularly evident in the qualitative analysis of the social world (Wyly, 2014). In this context, the researcher incorporates the employment crisis brought about by the development of AI and the resulting social conflict.

The study investigates the nature and extent of AI, with a particular focus on its application in hospitals. Specifically, it explores the use of rule-based and expert AI systems in eight hospital departments and examines their impact on employment. By

analyzing the consequences of AI on job structures and associated social conflict, the research establishes a philosophical ontology within the post-positivist framework. This approach integrates the subjective reality of AI into broader issues of employment and social conflict, thereby illustrating how technological developments are embedded in and influence societal dynamics.

3.2 Methodology

This thesis employs a qualitative approach, reflecting the dual nature of its subject matter, which encompasses both natural and social dimensions. AI, serving as the independent variable, necessitates a qualitative examination due to its intersection with the sociological phenomenon of employment, which functions as the dependent concept within the sociological domain. The qualitative approach is thus driven by the research questions and the inherent nature of the concept, shaping the overall structure of the thesis.

Data collection is conducted through personal interviews, non-participatory observations, and secondary data sources, adjusting with a qualitative data collection strategy. The subsequent data analysis incorporates both descriptive and analytical techniques, reinforcing the qualitative paradigm of the research. This analysis aims to establish a comprehensive understanding of the research insights by synthesizing information from various sources and methods and examining theory, practice, and policy from multiple perspectives to provide a nuanced understanding of the subject matter.

3.3 Research Design

In this thesis, the application of rule-based and expert AI features is analyzed across eight key sectors within the hospital. The integration of AI tools in these areas presents the potential for job creation, replacement, and displacement among employees. To ensure the successful implementation and integration of these AI changes, it is essential to establish proper measurement and evaluation frameworks. These frameworks facilitate the assessment of AI's impact on the workforce, ensuring that the transition enhances efficiency while addressing any potential challenges related to employment dynamics.

3.3.1 Sampling Frame

This thesis investigates a sample of 119 rule-based and expert AI tools implemented across eight sectors within KMC hospital. The sectors under examination collectively employ 1,214 individuals across various departments. Specifically, the healthcare department includes 444 employees, pathology has 34, radiology consists of 24 employees, administration employs 616, security has 44 staff members, housekeeping comprises 112 workers, driving has 5 employees, and pharmacy includes 14 staff members. All employees across these departments are included as subjects of the study, providing a comprehensive analysis of AI integration within the hospital's workforce.

Table 3.1

Sampling Frame

Department	Number of Staff
Healthcare	444
Pathology	34
Radiology	24
Administration	616
Security	44
Housekeeping	112
Driving	5
Pharmacy	14
Total	1214

Source: KMC Administration. Table explain, out of a total of 1,214 employees across eight departments of the hospital, 19 participants were purposively selected. From each department, two individuals were chosen, along with an additional three participants from the technical sector.

3.3.2 Sample Size

This thesis investigates the relationship between technology and employment, with a specific focus on the implementation of rule-based and expert AI within the technology sector. The study extends this analysis to explore the employment dynamics

within the hospital sector, particularly across eight departments at KMC. In this context, the independent concepts are the adoption and utilization of AI, while the dependent concepts include the creation, replacement, and displacement of employment. These concepts will be measured and analyzed in depth, providing a comprehensive understanding of the impact of AI on employment patterns within the hospital setting.

3.3.3 Sampling Method

This thesis incorporates all available data, given the relatively small size of both the AI and employment datasets. The inclusion of all accessible information is critical to substantiate the research findings. Due to the limited scope of the data, the thesis employs a purposive sampling method, ensuring that every data point is utilized in the analysis. This approach enhances the validity and reliability of the research outcomes, strengthening the justification for the conclusions drawn from the study.

3.3.4 Variables and Measurement

This thesis positions AI as the independent variable, which influences employment dynamics and acts as a determining factor. Employment, including its components such as creation, replacement, and displacement, is treated as the dependent variable. The interaction between these variables forms the basis for measurable outcomes within the study. While the quantity of AI tools will be quantified and employment figures will be recorded as numerical values, the qualitative nature of the relationship between AI and employment requires qualitative measurement to fully capture the complexities of this interplay. This dual approach ensures a comprehensive analysis of the subject matter.

3.3.5 Data Collection

For data collection, purposive sampling was employed, focusing on individuals whose characteristics are integral to the study. This method ensures that the data gathered is both relevant and adjusted with the research objectives, without attempting to represent the entire spectrum of employment groups.

During the data collection phase, information was gathered, recorded, and organized from various sources to establish meaningful connections between AI and employment. Primary data was obtained through face-to-face interviews and phone interviews, while secondary data was gathered from administrative records, online platforms, books, hospital journals, and library resources. Given the specialized nature

of the data, expert interviews were conducted as the primary method of data collection. Experts, selected for their knowledge and expertise, were the sole respondents to the questions of the study. These interviews were conducted through direct personal communication, phone calls, or online platforms, ensuring that the target respondents provided the necessary insights.

3.3.6 Data Analysis

Since descriptive methods incorporate objective reality, factual accuracy, and empirical data, my research employs this approach to examine the objective foundation of AI, the number of jobs involved in employment, and how these numbers reflect the new dimensions of employment creation, replacement, and displacement driven by the use of AI. Building on this, to depict and interpret the multidimensional societal conflicts arising from these changes, the interpretative method demands subject-oriented interpretation, interrelated realities, and explanatory analysis. Therefore, by capturing the internal dynamics of the conflict normalizing from the relationship between AI and employment, this approach allows us to establish their interconnection and reach a conclusion.

In this research, the methodological approach has been employed to address the reality that the conflict arising from the integration of highly developed AI into today's employment sector can only be resolved through an objective and subjective description and analyzation.

Data collection for this thesis is guided by qualitative methods, ensuring alignment with the research questions. The collected data will be analyzed in accordance with field conditions, employing a critical approach to assess its nature and relevance within the research framework.

As AI is a new technology and still developing new social conditions, its total effect is still not fully developed. Therefore, the interactions between AI and employment must be analyzed using descriptive data analysis, or existing data, to see what the trends are. Both AI and employment data are most likely objectively measured, although understanding the interplay between them is destructive rather than prescriptive. For this reason, the thesis describes both descriptive and analytic approaches to data and employs both the descriptive and analytic methodologies to obtain the picture of the data. The analysis incorporates features of rule-based and

expert AI systems as well as hospital-based data. In particular, healthcare and pathology data consist of three groups, and radiology data consists of two groups, while the remaining data is grouped into one group. From these groups, rule-based and expert AI systems will identify relationships by looking at the data and particularly the meaningful aspects of job creation, replacement, and displacement, as well as the conflict that can develop in either process.

3.4 Ethical Consideration

Since my research is in the medical field, which is a highly sensitive zone, I adhered to medical precautions during the research process. As it directly relates to human health, data collection was carried out while following medical protocols. When entering sensitive areas, I wore a medical apron, and, in some cases, I met respondents in risk-free locations at times convenient for them so as not to inconvenience them. I made sure to meet respondents only during their free time, and when a respondent was unable to meet, I made efforts to collect data at another time. Since meeting every respondent in person was not always possible, I conducted interviews over the phone. I followed the administrative rules and collected data with permission from the administration and ensured data security. I also obtained permission from the research committee to ensure the legal validity of the research.

3.5 Field Experience

Given the context of the rapid advancement of science and technology, the Dean's Office stressed in detail that undertaking a new sociological study in this age is very challenging. Unfortunately, we had this knowledge by the time the research journey began with serious challenges right at the beginning of the fieldwork. However, all the guidance, encouragement, and support of my academic supervisor allowed me to solve both the challenges and opportunities much easier. This allowed the fieldwork to turn into a valuable process of engaging with, then learning from, many diverse experiences on the ground.

The informant contributes greatly to data collection, as the interview method heavily depends on the responses of the interviewee. In the medical sector, challenges arise in data collection, and given the sensitive nature of the medical field, the challenges of handling data need to be given serious consideration. Confidentiality of informants is also of utmost importance to any data collection, as ensuring trust and

ethical behaviors during data collection will allow the process to move forward. Informants have a positive perception of their individual engagement, which encourages and motivates the informants about the data collection process. In recognizing that informants have busy lives and time is a factor, there is a need to be cognizant of informants, ensuring adequate time for engagement is provided while respecting their time in regard to the care of their patients. In regard to administrative information, it usually can be made available to some clarity in legal practice, while the Institutional Review Committee (IRC) will offer formal approval, ensuring the ethical practices of data collection. All individual information is usually protected according to hospital ethics, protecting individual privacy and confidentiality as outlined, and ensuring participants know the purpose and opportunity for research.

During the proposal defense, debates arise regarding the intersection of AI with the fields of conflict, peace, and development, establishing the topic as a widely discussed and significant area of study. Despite its relevance, the research committee advises against hosting a summit focusing solely on social science aspects of this subject. Although the topic attracts significant attention, securing expert guidance is difficult, as few individuals are well-prepared to provide advice on this complex area. Both official and field-level challenges highlight the research view, with Tribhuvan Teaching Hospital initially selected as the research site. However, access to sensitive information is inhibited due to the institution's hesitation to provide the necessary data.

CHAPTER IV

USE OF ARTIFICIAL INTELLIGENCE IN KATHMANDU MEDICAL COLLEGE SETTING

This study explores the consistent application of AI across eight sectors within a hospital setting and assesses its impact on employment dynamics within these sectors. A comprehensive investigation is conducted into the implementation of AI technologies and their effects on employment patterns across various hospital departments, providing a detailed analysis of the changes and outcomes.

4.1 Introduction

This chapter looks at the use of AI tools in the KMC Hospital context and particularly emphasizes using rule-based and expert AI systems to strengthen routine working practices across the eight sectors that comprise the service providers: doctors and nurses, pathology, radiology, administration, security, housekeeping, driving, and pharmacy. AI technologies facilitate efficiency and accuracy in tasks, which equates to better service quality and an improved experience for both sides of the service transaction. Each of the hospital sectors uses different AI tools to support their specific activities to ensure the service transaction can be delivered successfully.

Using AI tools creates not only service delivery but also the enhancement of service quality in hospitals. Fihn et al. (2019) acknowledge that the transformation of healthcare through AI will ultimately be beneficial to patients and caregivers as well as researchers. As such, there is increasing administrative initiative within hospitals to utilize AI to deliver health services more efficiently or to manage downsizing costs, whereby services continue to be delivered at a profit.

Although the uptake of AI has meant displaced employees, it has also set the stage for advanced service delivery systems in areas such as pharmacy, as well as providing increased efficiencies in health service delivery. In fact, AI in health service delivery has worked to unravel problems that have plagued hospitals over the decades, namely, data protocols and management issues, patient historical record recognition, and condition diagnosis.

The support by deep learning and AI algorithms has shown that complex medical conditions, such as atrial fibrillation, can be diagnosed far more accurately, which is predominantly attractive to hospitals as opposed to treatment only. Tasks that

took minutes, perhaps hours, were previously horrible when staff assessed their data management protocols. Now even as the process is more streamlined, we see that processes in a hospital are accurate and much less overwhelming when being processed through a machine. In closing, there are many different ways AI tools, both rule-based and expert systems, provide operational efficiency and quality service across a variety of different job sectors in hospitals, and we have only begun to explore using AI in hospitals.

4.2 Use of Artificial Intelligence in Healthcare

The healthcare sector in Nepal has increasingly adopted AI, resulting in notable transformations in hospital services. This adoption has enhanced both the quality and reliability of care, which, in turn, has contributed to an increase in patient load within hospitals.

4.2.1 Diagnosis AI in Healthcare

Technological advancements have played a crucial role in disease identification during the pandemic. The challenge of combating dangerous viruses persists, prompting exploration into three primary themes: disease screening for chronic illnesses, medical diagnosis turnaround time, and the utilization of AI to tackle COVID-19 diagnostic hurdles. Moses et al. (2022) underscores the significance of early disease detection through screening for effective prevention and treatment. Additionally, Fuster-Palà et al. (2024) highlight how the use of AI scanning tools speeds up the scanning process due to the nature of AI.

The dissertation addresses various challenges encountered by AI tools, including easy scanning and healthcare system issues such as population ageing and medical professional shortages, emphasizing the importance of early disease detection and appropriate patient triage (Chowdhury et al., 2020). Moreover, it discusses the limitations of current diagnostic methods like RT-PCR and explores AI's potential to enhance COVID-19 diagnosis through radiological imaging analysis. Overall, the text underscores the critical role of screening and AI-based solutions in improving healthcare efficiency and effectiveness, especially in the COVID-19 pandemic context (Panch et al., 2018). The hospital employs various AI diagnosis machines to serve patients and identify their medical issues. Different problems require specific AI features. Here's an overview of AI tools at KMC Hospital.

Figure 4.1

AI in Diagnosis



Source: KMC Administration. The figure explains, Robotic Surgery and Neuro Navigation System which can easily identify specific problem of brain source from KMC Hospital Neuro Department Dr. Amit Thapa's Team

Five doctors and three nurses work in the neuro department's robotic surgery and neuro navigation system, which helps surgeons navigate the brain's terrain during surgery by accurately locating brain issues like tumors or anomalies and creating a 3D map using real-time tracking and imaging data from CT or MRI scans (A. Thapa, personal communication, April 13, 2023).

R. Mahat told an AI sound wave analysis machine in the Speech and Hearing department helps an audiologist and an assistant find ototoxicity early on. The machine also prescribes and adjusts hearing aids (personal communication, May 18, 2023). Two CTG machines in the Gynae ward, operated by two doctors and assistants, continuously monitor fetal heartbeat and uterine contractions, offering insights into fetal well-being and facilitating timely interventions in high-risk pregnancies (R. Mahat, personal

communication, May 18, 2023). In the ICU and wards, twelve doctors and nurses utilize ECG machines to monitor heart activity, detect abnormalities promptly, and guide interventions or treatment adjustments, supporting routine cardiac screening and overall management of cardiovascular conditions (R. Mahat, personal communication, May 18, 2023).

In the Cardio OPD department, two echo machines aid two doctors and nurses in providing detailed cardiac function assessments, guiding effective therapy, and enhancing early diagnosis in intensive care settings (R. Mahat, personal communication, May 18, 2023).

Additionally, two TMT machines in the Cardio OPD run by trained users or nurses can use computer modeling to detect coronary artery disease (CAD) in diabetic patients without surgery (R. Mahat, personal communication, May 18, 2023). Furthermore, a PFT machine in the pulmonary OPD, managed by trained users or nurses, plays a crucial role in diagnosing respiratory diseases and preoperative evaluations, though its utilization remains relatively low due to various factors (R. Mahat, personal communication, May 18, 2023). Four EEG machines in the Neuro department, operated by trained users or nurses, facilitate diagnosis of neurological disorders and aid in research on brain function, offering predictive insights like seizure prediction (R. Mahat, personal communication, May 18, 2023). Additionally, trained users or nurses look at muscle electrical signals using two EMG machines in the neuro department.

This helps doctors diagnose neuromuscular disorders and uses machine learning to make prosthetic control better in KMC Hospital (R. Mahat, personal communication, May 18, 2023). Additionally, a trained user's use of an ultrasonic cleaner in the Dental OPD ensures the highest level of instrument cleanliness, reducing the risk of cross-contamination, and maintaining a sterile environment for dental procedures (R. Mahat, personal communication, May 18, 2023). users or nurses look at muscle electrical signals using two EMG machines in the neuro department. This helps doctors diagnose neuromuscular disorders and uses machine learning to make prosthetic control better in KMC Hospital (R. Mahat, personal communication, May 18, 2023).

Table 4.1*Diagnosis AI Tools*

Name of AI Tools	Quantity	Department	Users
Robotic Surgery and Neuro Navigation System	1	Neuro	Doctors, Nurses
CTG	2	Gynae ward	Doctor
ECG	12	ICU, Ward	Doctor, Nurse
Echo machine	2	Cardio OPD	Cardiologist
Endoscopy	3	Gastro Medicine	Doctor
Audiometry (Intelligent Hearing System)	1	Speech and Hearing	Audiologist
TMT Machine	2	Cardio OPD	Trained User (Nurse)
PFT	1	Pulmonary OPD	Trained User (Nurse)
EEG	4	Neuro	Trained User (Nurse)
EMG	2	Neuro	Trained User (Nurse)
Ultrasonic Cleaner	1	Dental OPD	Trained User
AB Scan	1	Eye OPD	Ophthalmologist
Auto Refractor	2	Eye OPD	Ophthalmologist
Humphrey Machine	1	Eye OPD	Ophthalmologist
Slit Lamp	3	Eye OPD	Ophthalmologist
Lensometer	1	Eye OPD	Ophthalmologist
Total	39		

Source: KMC administration. Table explain, AI tools for disease scanning are utilized by healthcare professionals, including doctors and nurses, across various departments for diagnostic and treatment purposes

Additionally, a trained user's use of an ultrasonic cleaner in the Dental OPD ensures the highest level of instrument cleanliness, reducing the risk of cross-

contamination, and maintaining a sterile environment for dental procedures (R. Mahat, personal communication, May 18, 2023). Furthermore, an A/B scan machine in the Eye OPD department, utilized by an ophthalmologist and assistant, offers real-time images of eye structures, aiding in diagnosis and resource allocation for eye care in KMC Hospital (R. Mahat, personal communication, May 18, 2023). Two auto refractive machines in the Eye OPD, operated by ophthalmologists, help in assessing dry eye syndrome and tear instability, though challenges persist in test reliability (R. Mahat, personal communication, May 18, 2023).

Moreover, a Humphrey Machine in the Eye OPD, operated by an ophthalmologist and assistant, aids in early diagnosis and management of visual field defects, enhancing patient quality of life in KMC hospital (R. Mahat, personal communication, May 18, 2023). Additionally, three slit lamp AI machines in the Eye OPD, utilized by ophthalmologists and assistants, ensure timely interventions and precise treatments for various eye conditions, improving patient outcomes and satisfaction (R. Mahat, personal communication, May 18, 2023).

Lastly, a lensometer in the Eye OPD, operated by an ophthalmologist and assistant, ensures accurate eyeglass prescription measurement and alignment, enhancing efficiency and accuracy in vision assessments (R. Mahat, personal communication, May 18, 2023). The lensometer in the Eye OPD guarantees precise eyeglass prescriptions and alignment, improving efficiency and accuracy during vision assessments, thereby enhancing overall patient eye care experience.

The use of AI tools in KMC diagnosis involves a diverse array of AI tools tailored to specific medical needs and enhancing diagnostic and therapeutic capabilities. In the neuro department, a robotic surgery and neuron navigation system revolutionize surgical practice by pinpointing brain issues with precision, empowering surgeons to navigate complex brain terrain and mitigate risks during procedures. Five doctors and three nurses use this system to combine real-time tracking and imaging data to produce detailed 3D brain maps. In the speech and hearing department, an intelligent hearing machine aids in the early detection of ototoxicity by analyzing audiometric exams using AI algorithms. It supports audiologists and their assistants in prescribing and adjusting hearing aids, contributing significantly to diagnosis and treatment planning.

Similar to this, two doctors and assistants operate the CTG machine in the gynecology ward, which continuously tracks fetal heartbeat and uterine contractions to enable maternity surveillance and timely interventions. In the ICU and wards, ECG machines, utilized by 12 doctors and nurses, provide real-time cardiac monitoring, aiding in prompt detection of cardiac issues and guiding interventions effectively. In the cardio OPD department, echo machines assist two doctors and nurses in detailed cardiac function assessments, improving diagnostic accuracy in ICU settings.

Furthermore, endoscopy machines in the gastro medicine department, TMT machines in the cardio OPD, PFT machines in the pulmonary OPD, EEG machines in the neuro department, and EMG machines in the neuro department offer specialized diagnostic capabilities, supported by trained users, nurses, and assistants. These tools leverage AI and machine learning techniques to enhance diagnostic accuracy, treatment planning, and patient care across various medical specialties.

Additionally, in dental and eye OPDs, trained professionals use ultrasonic cleaners, A/B scan machines, auto refractive machines, Humphrey machines, slit lamp AI machines, and lensometers with assistant support to ensure optimal cleanliness, accurate diagnostics, and efficient treatment planning in dental and ophthalmic care. The integration of these AI tools underscores the hospital's commitment to leveraging technology to improve healthcare delivery, enhance patient outcomes, and advance medical practice.

In the complex view of medical technology and healthcare provision at Mackay Base Hospital, conflicts and synergies emerge between AI tools and human relations. Across various departments, AI tools are integrated into clinical workflows, impacting both doctors and nurses. This dynamic is best exemplified by the Neuro Navigation System, which five doctors and three nurses use in the neuro department. This robotic surgery system revolutionizes surgical practice by pinpointing brain anomalies with precision, reducing invasive methods.

Similar to this, an audiologist and an assistant operate the audiometry machine in the speech and hearing department, which uses AI analysis to provide early detection of ototoxicity. However, challenges arise, such as misplaced transducers in CTG machines in the Gynae ward, necessitating internal positioning systems. While these tools aid in maternity surveillance, human oversight remains crucial for timely

interventions. In the ICU and wards, twelve doctors and nurses utilize ECG machines to monitor heart activity, with AI enhancing real-time data analysis.

Yet, ensuring accurate monitoring relies on human expertise in electrode placement and clinical interpretation. Similarly, in the cardio OPD, echo machines assist two doctors, but the need for comprehensive TTE training for intensivists underscores human involvement in leveraging technology effectively Dranove, and Garthwaite, (2022). Moreover, the integration of AI and machine learning in EMG machines in the neuro department highlights the synergy between human expertise and technological innovation, enhancing pattern recognition and diagnostic capabilities.

However, ensuring skilled implementation remains paramount. In the dental OPD, ultrasonic cleaners, operated by trained dental professionals, exemplify how human skill complements advanced technology to ensure optimal cleanliness and patient safety. In the eye outpatient department (OPD), AI tools like the slit lamp and lensometer help ophthalmologists diagnose conditions and prescribe accurate vision corrections. However, how well they work depends on how well humans can examine and interpret the data. Thus, while AI tools offer advancements in diagnostics and treatment, harmonizing human expertise with technological capabilities remains essential for optimizing patient care and outcomes in healthcare settings.

4.2.2 Treatment AI in Healthcare

A data-driven AI approach aimed at identifying healthcare services for development or co-creation through social media analysis. Leveraging big data analytics, seeks to discern needs and value propositions within social and digital media, fostering the co-creation of services driven by values such as equity and innovation (Alahmari et al., 2022). Focused on addressing urgent healthcare challenges like disease prevention and sustainable delivery, especially in cancer care in Saudi Arabia, this AI-based initiative offers promise in facilitating timely interventions and promoting triple bottom line sustainability (Schwab et al., 2021). By facilitating dynamic interactions among healthcare stakeholders via social media, aims to bolster equity and sustainability in service provision, aligning with broader societal goals. Esmailzadeh (2020) noted that although AI holds the potential to improve patient care and decision-making in healthcare, its acceptance and implementation necessitate a nuanced

understanding of user attitudes and perceptions, emphasizing the value-based adoption model in shaping consumer behavior towards AI technology.

In the hospital environment, various tools are utilized by healthcare professionals to treat patients, ensuring efficiency, accuracy, and credibility in healthcare tasks. Additionally, AI tools support patient treatment. In the ICU of KMC Hospital, a team comprising ten doctors and twenty nurses collaborates using various medical tools for critical care (Lee & Yoon, 2021). Ventilators, overseen by doctors with nursing support, are crucial for patients with compromised respiratory function, delivering regulated air volumes, often with added oxygen, to the lungs (R. Mahat, personal communication, May 18, 2023). Syringe pumps, used by doctors and nurses, ensure precise administration of fluids and medications across hospital units, providing accurate dosing over specified durations.

Healthcare professionals oversee disposable infusion pumps, which mechanically control the flow of fluids, with the specifications of tubing impacting flow rates and infection risks (R. Mahat, personal communication, May 18, 2023). In surgical settings, anesthesiologists use anesthesia machines to adjust gas combinations, ensuring the safe administration of anesthesia (R. Mahat, personal communication, May 18, 2023). Meanwhile, patient monitors, overseen by doctors and nurses, persistently monitor crucial signs, directing treatment choices and assessing treatment effectiveness. ECG machines, operated by doctors, assist in cardiovascular disease diagnosis with machine learning-enhancing diagnostic capabilities (R. Mahat, personal communication, May 18, 2023). Defibrillators, used by four doctors, offer essential treatment for cardiac arrhythmias, highlighting the need for device supervision to prevent malfunctions and ensure safety. Dialysis technicians and nurses manage machines for renal disease patients, with new technologies reducing risks like intradialytic hypotension (R. Mahat, personal communication, May 18, 2023). Surgeons utilize operating microscopes for precision in surgeries, reducing strain, while cautery machines aid tissue procedures with controlled electrical currents (R. Mahat, personal communication, May 18, 2023). In the gynecology ward of KMC Hospital, physicians employ CTG machines to oversee fetal well-being throughout pregnancy and childbirth, enabling prompt actions when necessary (R. Mahat, personal communication, May 18, 2023). Additionally, doctors oversee the use of incubators to support premature infants, ensuring their survival and growth in controlled conditions,

with advanced systems enhancing device efficiency and patient safety (R. Mahat, personal communication, May 18, 2023).

Table 4.2

Treatment AI in Healthcare

Name of AI Tools	Q.	Department	Users
Ventilator	46	ICU	Doctors
Syringe Pump	150	ICU, ER, High care Post op, OT, HDU	Doctor, Nurse
Infusion Pump	100	ICU, ER, High care Post Op, OT, HDU	Doctor, Nurse
Anesthesia	12	OT	Anesthesiologist
Patient Monitor	210	ICU, ER, High care Post Op, OT, HDU	Doctor, Nurse
ECG	12	ICU, Ward	Doctor, Nurse
Defibrillator	15	ICU, Cath lab, High care, ER	Doctor
Dialysis Machine	9	Hemodialysis unit	Dialysis Technician, Nurse
Operating Microscope	6	OT	Surgeons
Cautery	10	OT	Surgeons
CTG	2	Gynae ward	Doctor
Incubator	2	NICU	Doctor
Baby Warmer	40	NICU	Doctor
Laser	2	OT	Surgeons
Endoscopy	3	Gastro Medicine	Doctor
Fibro scan	1	Diagnostic	Trained User (Nurse)
Phototherapy Machine	1	Dermatology	Trained User

Cautery	1	Dermatology	Trained User
Laser	1	Dermatology	Trained User
Iontophoresis	1	Dermatology	Trained User
CPM machine	2	Physiotherapy	Physiotherapist
Electrotherapy	1	Physiotherapy	Physiotherapist
IFT Machine	1	Physiotherapy	Physiotherapist
Intermittent Traction	1	Physiotherapy	Physiotherapist
Muscle Stimulator	1	Physiotherapy	Physiotherapist
Short Wave Diathermy	1	Physiotherapy	Physiotherapist
Ultrasonic Therapy	1	Physiotherapy	Physiotherapist
Total	632		

Source: KMC Administration. The table presents details on the utilization of AI tools by medical professionals, including doctors and nurses. It outlines the specific tools employed, their respective quantities, and the departments in which they are utilized throughout the treatment process.

Furthermore, baby warmers, also operated by doctors, regulate body temperature for fragile newborns, with advanced algorithms enhancing temperature stability and control, underscoring the importance of technology in neonatal care (R. Mahat, personal communication, May 18, 2023). Laser machines, used by surgeons in the OT, offer versatile capabilities for cutting, marking, and other surgical applications, highlighting the integration of technology into modern surgical practices (R. Mahat, personal communication, May 18, 2023).

In the Diagnostic Department, doctors operate endoscopies using advanced robotic platforms and new techniques such as Natural Orifice Transluminal Endoscopic Surgery (NOTES). These tools help the procedure go more smoothly and keep patients safe (Kaan & Ho, 2020). To detect liver fibrosis without harming it, trained professionals use a fibro scan with assistance from an assistant in the diagnostic departments and the significance of early detection and treatment of liver diseases (R.

Mahat, personal communication, May 18, 2023). Trained operators oversee phototherapy equipment to deliver light therapy for diverse skin ailments, under the supervision of licensed healthcare experts, thus guaranteeing the safety and efficacy of treatment results (R. Mahat, personal communication, May 18, 2023). Also, trained users in the Dermatology Department use cautery machines, laser machines, and iontophoresis machines to do different procedures precisely and safely. This shows how important it is to get the right training and be supervised when using medical devices (R. Mahat, personal communication, May 18, 2023)

Physiotherapists use CPM machines, electrotherapy machines, IFT machines, intermittent traction devices, muscle stimulator machines, shortwave diathermy machines, and ultrasonic therapy machines in the Physiotherapy Department to help with joint rehabilitation, pain management, and tissue recovery, emphasizing the individualized approach and expertise needed in physiotherapeutic interventions (R. Mahat, personal communication, May 18, 2023). Each medical tool mentioned serves a specific function in patient care, with proper citation acknowledging the expertise and insights provided by R. Mahat (personal communication, May 18, 2023) and other relevant sources.

In the modern development of AI tools of treatment in KMC Hospital, a wide array of medical equipment and tools are employed across various departments and units within the hospital, each serving specific functions under the supervision of trained users. Ventilators are utilized in critical care settings to support patients' breathing when they are unable to do so independently. Syringe pumps accurately administer fluids or medications into patients' bodies, while disposable infusion pumps control fluid flow using mechanical restrictions. Anesthesia machines aid in regulating gas flow, oxygen levels, and anesthetic concentration during surgical procedures. Patient monitors continuously track physiological parameters to guide critical care and assess treatment effects. ECG machines measure heart electrical activity, enhancing diagnostic capabilities through machine learning analysis.

Defibrillators are crucial for addressing cardiac events and improving patient safety in complex healthcare environments. Dialysis machines sustain patients with renal failure by removing waste and fluid. Operating microscopes enhance visibility and precision during surgery, reducing strain on surgeons. Cautery machines and lasers aid in tissue procedures across various medical disciplines, ensuring safe and effective

treatment. CTG monitors fetal health during pregnancy and labor, aiding in timely management decisions.

Incubators provide critical care for premature infants, while baby warmers maintain their body temperature for health and growth. Endoscopies and fibroscans aid in diagnosing and managing various conditions. Phototherapy machines, cautery machines, lasers, and iontophoresis machines serve specific purposes in dermatology. CPM machines, electrotherapy machines, intermittent traction, muscle stimulators, shortwave diathermy, and ultrasonic therapy machines are utilized in physiotherapy for rehabilitation and pain management. Throughout these applications, the importance of trained users, supervision by healthcare professionals, and adherence to safety protocols is emphasized to ensure optimal patient outcomes and safety.

In the KMC, healthcare professionals use a variety of AI tools for treatment. In the KMC hospital, medical personnel employ various tools, such as ventilators, syringe pumps, disposable infusion pumps, patient monitors, ECG machines, and defibrillators, to provide crucial care to patients with respiratory failure, cardiac issues, and other health conditions affecting their well-being and surgeons in the OT utilize anesthesia machines, operating microscopes, cautery machines, lasers, endoscopies, and CTGs for surgical procedures and patient monitoring. In the diagnostic department, trained users employ fibrosis scans, phototherapy machines, and iontophoresis machines for various diagnostic and therapeutic purposes. Physiotherapists utilize CPM machines, electrotherapy machines, IFT, intermittent traction, muscle stimulators, shortwave diathermy, and ultrasonic therapy machines for physical therapy and rehabilitation.

However, despite the advancements in medical technology, incidents of malfunction persist, highlighting the need for efficient supervision mechanisms to ensure patient safety. Additionally, conflicts may arise in job sectors as traditional roles evolve with the integration of AI tools, requiring continuous training and adaptation for healthcare professionals to utilize these tools effectively and safely while optimizing patient care.

4.2.3 Supportive AI in Healthcare

The hospital revolves around the financial implications of intensive care on healthcare systems, with a focus on ICU bed availability and utilization. The concept of demand elasticity in ICU utilization suggests that increased bed availability may lead

to higher admissions, even for patients unlikely to significantly benefit from intensive care. This phenomenon highlights the importance of appropriately targeting ICU admissions to patients who would derive the greatest benefit from such care, especially in settings with increased bed supply (Gooch & Kahn, 2014). Furthermore, the KMC hospital uses the rapid evolution of mobile phone technology and its impact on healthcare, including the proliferation of mobile health (mHealth) apps aimed at both lay users and healthcare professionals.

However, it acknowledges the challenges and risks associated with mobile device use in healthcare, such as patient harm from certain apps and concerns about security and privacy breaches (Mobasher et al., 2015). Moreover, there lies an importance of integrating information and communication technologies (ICT) into healthcare settings, with a focus on selecting appropriate hardware devices that complement the mobile and collaborative nature of medical work (Andersen et al., 2009). The study has aimed to explore these relationships to inform system planners and implementers about effective strategies for deploying ICT systems in healthcare environments.

Various supportive AI tools enhance healthcare performance in hospital settings, streamlining daily tasks to make them easier and faster to execute. In the ICU department of KMC Hospital, doctors and nurses rely on 33 ICU beds, which are crucial for providing intensive care to critically ill patients. These beds are designed with various features to ensure optimal patient care, close observation, and the facilitation of medical procedures. As explained by R. Mahat (personal communication, May 18, 2023), ICU beds are equipped to support round-the-clock monitoring and cutting-edge medical interventions, enhancing patient safety and healthcare personnel's ability to deliver top-quality care in a dynamic clinical environment.

Additionally, according to Technician S. Ojha (personal communication, May 20, 2023), doctors and nurses use 11 laptops and computers for crucial healthcare tasks like electronic health records management, order input, documentation, communication, research, and education. These tools significantly improve efficiency and enable healthcare professionals to enhance the standard of care for their patients. Additionally, A. Thapa (Personal Communication, April 13, 2023) discussed how healthcare professionals use 444 smartphones in their daily routines to gather additional information on patient treatment through platforms like LLM and other websites, which

is useful for successfully navigating the treatment process. R. Mahat (personal communication, May 18, 2023) emphasized that trained users use EtO for sterilization in the CSSD department with strict safety protocols in place due to its hazardous nature.

Control methods and systems are crucial for limiting worker exposure and ensuring safe levels of EtO emissions. Similarly, in dental OPD, 10 dental chairs serve as central components for various dental procedures, although they pose infection risks due to microbial contamination, as discussed in studies evaluating infection control practices. Additionally, technicians and assistants in the OT department use 12 OT lights and OT tables to maintain environmental cleanliness and maximize operational efficiency, with 'no-touch' technologies like UV-light disinfection systems showing promise in successfully eradicating pathogens on high-touch surfaces. Overall, these tools play supportive roles in healthcare settings, contributing to patient care, safety, and operational effectiveness, albeit with the need for stringent safety measures and infection control practices.

In the provided text, various tools utilized by healthcare professionals are detailed, each serving crucial functions within their respective departments. Doctors and nurses rely on ICU beds for intensive care, where these beds not only provide comfort but also enable close observation and medical procedures for critically ill patients, enhancing patient safety and healthcare personnel efficiency. Computers, used extensively by doctors and nurses, aid in healthcare delivery, patient management, and administrative tasks, improving the standard of care through efficient work processes. Smartphones serve as valuable resources for gathering patient information, aiding doctors and nurses in understanding critical issues, and navigating the treatment process effectively.

In the CSSD department, trained users utilize ETO sterilization systems, crucial for sanitizing medical equipment, albeit posing hazards to workers and necessitating strict safety protocols. Dental chairs in dental OPD facilitate various dental procedures but require vigilance against microbial contamination, highlighting the importance of infection control practices. OT lights and tables are essential in the OT department, where environmental contamination is managed through advanced disinfection technologies like UV-light systems.

Table 4.3*Supportive AI in Healthcare*

Name of AI Tools	Quantity	Department	Users
ICU bed	33	ICU	Nurse/ Doctor
Computer/Laptop	11	Common	Doctor/Nurse
Smart Phone	444	Common	Doctor/Nurse
Autoclave	3	CSSD	Trained User
ETO	1	CSSD	Trained User
Dental Chair	10	Dental OPD	Trained User
OT Light	12	OT	OT Technicians/Assistant
OT Table	12	OT	OT Technicians/Assistant
Total	526		

Source: KMC Administration. The table presents details Supportive AI tools are utilized by medical professionals, including doctors and nurses, across various departments and in varying quantities to aid in the treatment process.

Additionally, operational problems in critical care units, like not having enough ICU beds, lead to research into bed-reservation strategies using simulation models to improve patient care and operational efficiency. This is part of ongoing efforts to improve healthcare delivery.

Different personnel in the healthcare system use various AI tools to improve patient care and operational effectiveness, but conflicts occur in resource allocation and capacity management. Doctors and nurses rely on 33 ICU beds to treat critically ill patients, with ICU bed availability crucial for patient outcomes. A specialized medical bed, the ICU bed, ensures round-the-clock observation and cutting-edge medical attention for seriously ill patients.

Meanwhile, doctors and nurses use 11 computers and laptops for healthcare delivery, patient management, and administrative tasks, enhancing the standard of care. Additionally, they utilize 444 smartphones to gather patient information and aid in treatment decisions. In the CSSD department, trained users employ ETO sterilization

systems, which are vital for sanitizing medical equipment but pose hazards to workers, necessitating stringent safety protocols.

Similarly, in dental OPDs, 10 dental chairs facilitate dental procedures but harbor microbial contamination, posing infection risks despite sterilization efforts. In OT departments, environmental contamination is addressed through ‘no-touch’ technologies like UV-light disinfection systems. However, conflicts emerge in ICU operations due to the replacement of the labor force, where beds are managed by one staff member without the support of assistants, leading to job displacement scenarios and conflicts in utilizing supportive AI tools.

4.3 Use of AI in Pathology

The given text discusses the integration of AI into pathology practices, particularly in hospitals, invites both the potential benefits and challenges. Nakagawa et al. (2023) underscore the importance of utilizing AI tools for improved diagnoses and treatment options while addressing concerns such as data diversity, bias, interpretability, security, and regulatory compliance. It can be outlined that the collision between the pathology and AI worlds, illustrating examples of AI systems entering the market and the associated challenges in implementation, validation, and maintenance within clinical settings. It addresses upstream challenges like data acquisition and algorithm training, as well as downstream issues such as dataset shift and model recalibration.

Human factors like deskilling and burnout, along with societal implications including health equity and data inclusion, are also discussed. It can emphasize that the necessity of addressing biases in AI and ensuring privacy-preserving collaborations, acknowledges the infancy of AI technology and the need for continued development and transparency in implementation. Colling et al. (2019) provides a roadmap for the collaborative development of AI tools in pathology, stressing the importance of evidence-based frameworks meeting regulatory approval. The narrative, further supported by Försch et al. (2021), elucidates collaborative efforts between medical institutions and industry partners in developing AI systems for diagnosis and treatment, as well as the current status of AI implementation in pathology, paving the way for its transformative potential in diagnostic medicine. The integration of AI into pathology workflows, facilitated by digital pathology and whole slide imaging (WSI) technology,

is seen as a crucial step toward more efficient and accurate disease diagnosis, ultimately shaping the future of healthcare (Parwani, 2019). The adoption of cutting-edge technology in pathology not only facilitates access to healthcare in remote areas but also manages the substantial patient influx within resource-constrained settings while maintaining quality.

The transformative integration of AI into pathology workflows, supported by digital pathology and WS technology, plays a pivotal role in this advancement. By harnessing AI algorithms alongside digital platforms, healthcare providers strive to improve the efficiency and accuracy of disease diagnosis, marking a significant milestone in medical practice. This integration streamlines conventional pathology processes and holds the promise of revolutionizing healthcare delivery by enabling remote viewing, sharing, and analysis of pathology slides, ultimately enhancing accessibility and quality of care.

4.3.1 Analyzer AI in Pathology

The use of analyzer AI tools, the pivotal role of AI tools enhances diagnostic processes within hospital laboratories. Gasparin et al. (2022) introduce the Hilab system as an innovative AI platform aimed at improving access to essential diagnostic tests like complete blood count (CBC), particularly in resource-constrained settings. This AI-powered system utilizes machine learning and deep learning techniques to analyze blood samples and provide CBC parameters, addressing challenges associated with traditional analyzers such as limited accessibility and delays in medical diagnosis. Meanwhile, Place et al. (1994), discuss the broader implications of AI technology in laboratory operations, emphasizing its capacity to handle incomplete information and emulate human-like pattern recognition. They advocate for better documentation and evaluation of AI systems in clinical settings to optimize healthcare delivery and patient outcomes.

Furthermore, Da Rin (2009), delves into the intricacies of the total testing process (TTP), highlighting the importance of the pre-analytical phase and the potential integration of AI tools to streamline laboratory workflows and ensure accurate and timely results. Overall, these texts underscore the transformative potential of AI Analyzer tools in hospital laboratories, aiming to revolutionize diagnostic processes and improve patient care. In the KMC laboratory, lab technicians and assistants utilize

various AI analyzer tools to efficiently and accurately perform their daily tasks. These tools enable rapid and precise analysis, enhancing the laboratory's capabilities and ensuring high-quality results.

Figure 4.2

Analyzer AI Tools



Source: KMC Administration. The figure explain, BECKMAN COULTER AU480 Machine can test 900 sample per hours source by Pathology Department of KMC Hospital

It is easier for the lab technician and assistant to do their daily work because they use the Siemens Healthiness-made ADVIA Centaur CP Immunoassay System for different immunoassays in the clinical laboratories of the KMC hospital (personal communication, May 12, 2023) to measure things like hormones, antibodies, proteins, and drugs in biological samples like blood or serum (A.T. Magar).

The Clinquant-Micro Biochemistry Analyzer, employed at KMC Hospital, serves as a fully automated tool for measuring various biochemical parameters in blood and body fluids, including glucose, creatinine, urea, and more, suitable for small to mid-sized laboratories (A.T. Magar, personal communication, May 12, 2023). According to M.R. Khadka (personal communication, May 11, 2023), Thapa talks about how important it is for the KMC hospital to have the fully automated hematology analyzer

Sysmex XP 100 Machine for measuring blood cell parameters that help doctors diagnose and treat patients.

Furthermore, the Vchem Next biochemistry analyzer, also in use at KMC Hospital, assists in measuring a range of biochemical parameters (M.R. Khadka, personal communication, May 11, 2023). An electrolyte machine, crucial for measuring electrolyte concentrations and blood gases in patients, along with intelligent cooling refrigerators for specimen storage, are integral tools in KMC Hospital's lab setup (A.T. Magar, personal communication, May 12, 2023).

The Automated Protein Analyzer MISPA i3 is used in research and clinical settings to measure proteins (A.T. Magar, personal communication, May 12, 2023) and the Lipotropic H8 Hemoglobin Analyzer helps figure out how much hemoglobin is in the blood. According to M.R. Khadka (personal communication, May 11, 2023), the ST-200 aqua electrolyte analyzer helps measure electrolytes in blood samples, and specific protein analyzers like the MISPA i2 help with research and diagnosis. Additionally, the PT1000 and Wondfo Blood Gas Analyzers play crucial roles in assessing blood gas parameters (A.T. Magar, personal communication, May 12, 2023).

In the further explain of *Figure 4.2* The Selecta Automatic Biochemistry Analyzer is instrumental in diagnosing and monitoring various medical conditions, while the Yumizen H550 Hematology Analyzer by HORIBA and the Horiba Hematology Analyzer provide automated analysis of blood samples (A.T. Magar, personal communication, May 12, 2023).

The ABX Micros ES 60 Hematology Analyzer performs complete blood counts and related hematological tests, aiding in diagnosing and monitoring medical conditions (M.R. Khadka, personal communication, May 11, 2023). Lastly, automatic immunoassay analyzers automate the immunoassay process in KMC Hospital, playing a crucial role in disease diagnosis, patient monitoring, and medical research endeavors (A.T. Magar, personal communication, May 12, 2023). The utilization of automatic immunoassay analyzers at KMC Hospital underscores their pivotal role in advancing healthcare practices.

To make daily operations and diagnostic procedures easier in the described laboratory setting, lab technicians and assistants use a variety of tools.

Table 4.4*Analyzer AI in Pathology*

Name of AI Tools	Q.	User
ADVIA centaur CP Immunoassay System	1	Lab Technician/Assistant
Clinquant-Micro Biochemistry Analyzer	1	Lab Technician/Assistant
Sysmex XP 100 Machine	1	Lab Technician/Assistant
Vchem Next Biochemistry Analyzer	1	Lab Technician/Assistant
Electrolyte Machine	1	Lab Technician/ Assistant
Intelligent Cooling Refrigerator	1	Lab Assistant
Lipotropic H8 Hemoglobin Analyzer	1	Lab Technician/Assistant
Automated Protein Analyzer-Mispa i3	1	Lab Technician/Assistant
ST-200 aqua electrolyte Analyzer	1	Lab Technician/Assistant
Specific Protein Analyzer Mispa i2	1	Lab Technician/Assistant
PT1000 Blood Gas Analyzer	1	Lab Technician/Assistant
Wondfo Blood Gas Analyzer	1	Lab Technician/Assistant
Selectra Automatic Biochemistry Analyze	1	Lab Technician/Assistant
Automatic Hematology analyzer-Yumizen H550 HORIBA	1	Lab Technician/Assistant
Horiba Hematology Analyzer	1	Lab Technician/Assistant
ABX Micros ES 60	1	Lab Technician/Assistant
BECKMAN COULTER AU480 Machine	1	Lab Technician/Assistant
Total	18	

Source: KMC Administration. Table present details of 18 types and 18 tools of Analyzer AI tools autonomously complete various laboratory asks without the need for human support, revolutionizing diagnostic processes and enhancing efficiency in healthcare settings.

The ADVIA Centaur CP Immunoassay System is utilized for conducting a wide range of immunoassays, measuring specific substances in biological samples in KMC Hospital. The Clinquant-Micro Biochemistry Analyzer and the Vchem Next

biochemistry analyzer serve to measure a plethora of biochemical parameters in blood and body fluids, catering to small to mid-sized laboratories. The Sysmex XP 100 Machine is employed for automated hematology analysis, measuring various blood cell parameters.

Additionally, electrolyte machines, including the ST-200 aqua electrolyte analyzer, are instrumental in measuring concentrations of electrolytes and gases in blood samples. For example, the Intelligent Cooling Refrigerator is used to keep specimens fresh, the Lipotropic H8 Hemoglobin Analyzer is used to measure hemoglobin levels, and the Automated Protein Analyzer (Mispa i3) is used to count proteins.

Furthermore, blood gas analyzers like the PT1000 Blood Gas Analyzer and the Wondfo Blood Gas Analyzer provide critical insights into respiratory and metabolic status. The Selectra Automatic Biochemistry Analyzer and various hematology analyzers, such as the Yumizen H550 by HORIBA and the ABX Micros ES 60, aid in biochemical and hematological analysis, respectively. Finally, automatic immunoassay analyzers automate the process of immunoassays, facilitating disease diagnosis, patient monitoring, and medical research. Each tool serves a specific function, collectively contributing to the efficiency and accuracy of diagnostic procedures in the laboratory.

Different job sectors use a variety of AI tools, such as the ADVIA Centaur CP Immunoassay System that lab assistants and technicians use to conduct immunoassays measuring analytes in biological samples. The implementation of the Selectra Automatic Biochemistry Analyzer and Sysmex XP 100 Machine in clinical laboratories, which may replace manual labor, is an example of how conflict arises in various job sectors as a result of the reliance on these tools. Additionally, in the healthcare sector, the Yumizen H550 Hematology Analyzer and ABX Micros ES 60 automate blood cell analysis, posing a challenge to traditional hematological testing methods. Furthermore, the introduction of automatic immunoassay analyzers revolutionizes disease diagnosis and patient monitoring, impacting the roles of laboratory professionals. This technological shift prompts adaptation and potential job reevaluation within these sectors, as automation reshapes workflow dynamics and demands new skill sets to effectively integrate AI tools into daily operations.

4.3.2 Non-Analyzer AI in Pathology

In the various aspects of laboratory practices and healthcare, each with its own specific focus, the importance of accuracy and precision in analytical testing systems within clinical laboratories is emphasized. This is crucial for ensuring reliable diagnostic results, with clinical laboratories establishing their own standards for accuracy and precision, often using control materials for calibration purposes (Bhattarai et al. 2022). It is common practice in laboratories to utilize control materials with known analyte concentrations to maintain accuracy and precision in testing procedures.

The focus shifts to blood lipid testing and the complexities involved in obtaining accurate results, including the choice of anticoagulants and specimen stability. Le and Le (2023) highlight the need for further research into the effects of specific anticoagulants, such as sodium fluoride-potassium oxalate (NaF-KOx), on biochemical parameters beyond blood glucose testing. The historical evolution of healthcare technologies, particularly the role of incubators in facilitating research and sample incubation in laboratories (Shukahi, 2020). Finally, the significance of incubators in providing optimal conditions for the growth and reproduction of microorganisms contributes to advancements in medical research and diagnosis. Overall, these texts underscore the ongoing efforts to enhance accuracy, reliability, and efficiency in laboratory practices within healthcare settings.

Different types of non-analyzer AI tools are utilized in the laboratories of KMC for sample testing purposes, including: In the lab, technicians at KMC utilize various tools for daily tasks, each serving specific functions crucial for diagnostic and research purposes, with a proper citation for reference. Pathologists can use Fine Care Plus, a point-of-care test, to help them figure out if someone has an acute kidney injury (AKI). It does this by checking the blood levels of NGAL and cystatin C. This makes it easier to find AKI early and keep an eye on treatment (M.R. Khadka, personal communication, May 11, 2023) An accurate measurement of glycated hemoglobin (HbA1c) levels is needed to diagnose and treat diabetes (M.R. Khadka, personal communication, May 11, 2023) with HBA1c/pc+.

The ABG machine measures arterial blood parameters vital for diagnosing respiratory, cardiac, renal, and metabolic disorders in patients at KMC Hospital (A.T. Magar, personal communication, May 12, 2023).

Table 4.5*Non-Analyzer AI in Pathology*

Name of AI Tools	Quantity	User
Fine care	1	Lab Technician
HBA1c/pc+	1	Lab Technician
ABG Machine	1	Lab Technician
Remi Centrifuge Machine	1	Lab Technician
BECKMAN COULTER AU 480 Machine	1	Lab Technician
BD BACTEC FX40	1	Lab Technician
Laboratory Incubator	1	Lab Technician
REMI BR-240 Blood Bank Refrigerator	1	Lab Technician
Thermon Scientific Shandon Finesse ME Microtome	1	Lab Technician
Total	9	

Source: KMC Administration. The table presents these 9 types of Non-Analyzer AI tools assist in various laboratory tasks, working alongside human operators to perform tasks such as data management, image analysis, and quality control. The machine completes the task with the support of human force, ultimately outputting the test results for further analysis and interpretation.

The Remi Centrifuge Machine separates various materials, including blood cells and proteins, for analysis (M.R. Khadka, personal communication, May 11, 2023). The Beckman Coulter AU480 Machine is utilized for biochemical and immunochemical tests, aiding in the diagnosis and monitoring of medical conditions (A.T. Magar, personal communication, May 12, 2023). BD BACTEC FX40 automates blood culture testing, detecting microorganisms in blood specimens, and KMC lab technicians and laboratory incubators provide controlled environments for biological growth and experiments (M.R. Khadka, personal communication, May 11, 2023). The REMI BR-240 Blood Bank Refrigerator ensures safe storage of blood products (A.T. Magar, personal communication, May 12, 2023). Lastly, the Thermo Scientific Shandon

Finesse ME Microtome prepares thin tissue sections for microscopic analysis in histopathology laboratories (M.R. Khadka, personal communication, May 11, 2023) at KMC Hospital.

Lab technicians use a variety of tools in the laboratory for daily tasks. The Fine Care Plus serves as a point-of-care test for diagnosing acute kidney injury (AKI) by measuring levels of NGAL and cystatin C in KMC lab. HBA1c/PC+ aids in monitoring blood sugar levels for diabetes diagnosis and management. The used of ABG machine measures arterial blood gas levels, which is crucial for diagnosing respiratory and metabolic disorders of sample.

The Remi Centrifuge Machine separates various materials, like blood cells and proteins. The Beckman-Coulter AU480 conducts biochemical tests for diagnosing medical conditions. The BD BACTEC FX40 automates blood culture testing for microorganism detection. Laboratory incubators create controlled environments for biological growth and experiments. The REMI BR-240 Blood Bank Refrigerator preserves blood products. The Thermo Scientific Shandon Finesse ME A microtome prepares tissue sections for microscopic analysis in histopathology. These tools collectively facilitate diagnostic, monitoring, and research tasks within the lab environment.

Lab technicians utilize various AI tools for their daily tasks in the lab. By checking the amounts of NGAL and cystatin C in the blood, Fine Care Plus in the KMC lab is a point-of-care test that helps pathologists diagnose acute kidney injury (AKI). HBA1c/pc+ is crucial for monitoring blood sugar levels accurately, particularly in diabetic patients. The ABG machine measures arterial blood gases, assisting in diagnosing respiratory and metabolic disorders in the sample. The Remi Centrifuge Machine separates various materials for analysis, including blood cells and proteins. The Beckman Coulter AU480 conducts biochemical tests efficiently, aiding in diagnosing conditions such as glucose, creatinine, and cholesterol levels.

The BD BACTEC FX40 automates blood culture testing to detect microorganisms like bacteria. Additionally, the laboratory incubator provides a controlled environment for the growth of biological samples. The REMI BR-240 Blood Bank Refrigerator ensures the preservation of blood and blood products. Lastly, the Thermo Scientific Shandon Finesse ME Microtome precisely prepares tissue sections

for microscopic analysis. However, the integration of these AI tools has led to conflicts in job sectors, as some traditional roles may become automated, requiring technicians to adapt to new technologies and skills.

4.3.3 Receptionist AI in Pathology

The growing importance of patient involvement in KMC hospital healthcare decision-making and the pivotal role of technology, particularly smartphones and mobile applications, in providing access to health information, including laboratory test results, Jovičić et al. (2019) emphasize the necessity of evaluating the quality of health-related information on the internet and mobile apps, citing various methodologies and guidelines for quality assessment. Furthermore, it discusses a survey aimed at reviewing and assessing health apps managing laboratory medicine data on popular smartphone platforms, highlighting the need for reliability and accuracy in supporting healthcare decision-making.

In a similar vein, Wycoff and Wagner (1978) discuss the implementation of a laboratory computer system at the University of Iowa Hospitals and Clinics, emphasizing the integration of laboratory data with the hospital information system through a high-speed communications link. This integration enhances the efficiency of data sharing between the laboratory and other hospital departments. Additionally, Delorme and Cournoyer (1980) describe an online computer system for a university hospital laboratory in microbiology, which streamlines various laboratory processes and facilitates the transmission of clinical microbiologic test results to medical records. This system demonstrates the benefits of distributed laboratory computing in enhancing laboratory operations and supporting clinical decision-making processes within hospital settings.

In the reception area of the pathology department, various AI tools are employed to facilitate reception activities. These tools make daily tasks easy to manage and execute efficiently. Different users use various tools in the KMC pathology reception to ensure smooth operations. Computers, utilized by receptionists, lab technicians, and pathologists, serve multifaceted functions, including digital pathology, managing patient data, slide scanning, image analysis, telepathology, reporting, decision support, research, education, quality assurance, and laboratory management (S. Ojha, personal communication, May 20, 2023). Calculators, essential for receptionists, aid in billing,

financial transactions, specimen analysis, inventory management, and budget planning, minimizing errors and maintaining accuracy (S. Roka, personal communication, May 12, 2023).

Table 4.6

Receptionist AI in Pathology

Name of AI Tools	Q.	Users
Computer	9	Receptionist and Lab Technician
Calculator	3	Receptionist
Smart Phone	22	Receptionists, Lab Technicians/Assistants
Printer	4	Receptionists
Total	38	

Source: KMC Administration. The table presents a total of 38 tools is utilized across four distinct groups to manage reception services within the hospital, ensuring efficient patient flow and delivering high-quality and prompt service.

Smartphones, utilized by receptionists, lab technicians, and assistants, enable efficient communication, organization, access to patient records, scheduling, and real-time coordination with healthcare professionals, enhancing workflow and patient care in medical facilities (S. Ojha, personal communication, May 20, 2023). Printers, crucial for receptionists, are indispensable for generating hard copies of patient records, laboratory results, invoices, and administrative documents, ensuring compliance, swift decision-making in emergencies, and patient satisfaction (S. Karki, personal communication, May 11, 2023). These tools work together to support the efficient operation of pathology receptions, highlighting their crucial roles in preserving accuracy, effectiveness, and quality of care as per appropriate citation protocols.

Pathologists extensively use computers in pathology reception for tasks like digital pathology, patient data management, research, and various analytical processes. They play a critical role in enhancing accuracy, efficiency, and communication within the field. Receptionists rely on calculators to ensure precise calculations for financial transactions, specimen analyses, inventory management, and budget planning, crucial for maintaining accuracy and efficiency in the department.

Smartphones are indispensable tools for receptionists, lab technicians, and assistants, enabling efficient communication, access to patient records, scheduling, and coordination between staff and healthcare professionals, thereby optimizing workflow and patient care of the KMC pathology lab. Printers are essential for generating hard copies of patient records, laboratory results, and administrative documents, ensuring compliance, swift decision-making, and patient treatment in emergency situations, and highlighting their importance in maintaining operational integrity and patient satisfaction in pathology reception.

Different users in the pathology department use various AI tools to improve efficiency and streamline operations. Pathologists utilize computers for tasks ranging from analyzing tissue samples to managing patient data, benefiting from digital pathology, information systems, image analysis software, and more. Receptionists heavily rely on calculators for accurate financial transactions and specimen analyses, ensuring precise measurements and efficient resource allocation.

Smartphones are essential for receptionists, lab technicians, and assistants, enabling seamless communication, organization, and access to critical information, ultimately optimizing workflow and enhancing patient care. Additionally, printers are indispensable to KMC lab reception for receptionists, facilitating the generation of hard copies crucial for maintaining accurate records and ensuring effective communication, particularly in emergency situations. However, while these AI tools significantly improve operations, their integration may also lead to conflicts in job sectors, as traditional roles evolve and adapt to technological advancements, potentially requiring additional training or reorganization to address new demands and responsibilities.

4.4 Use of AI in Radiology

The evolving role of AI in various aspects of radiology, each contributing to a deeper understanding of its impact on healthcare. Jalal et al (2021) highlight the demands faced by emergency radiologists, emphasizing the potential of AI to address challenges related to high imaging volumes, accuracy, and rapid report turnaround times. Waymel et al (2019) discuss the exponential increase in scientific publications on AI in radiology, emphasizing its potential to enhance workflow efficiency and decision support across different radiological functions.

Strohm et al (2020) delve into the recognition and impact of AI in clinical radiology, shedding light on the narrative of potential radiologist displacement and the barriers to successful AI implementation .Finally, Goldberg and Rosenkrantz (2019) explore public perspectives on AI integration in radiology via Twitter, highlighting both the promising results of AI in radiological functions and the associated challenges, including regulatory issues and patient acceptance (Murugesan et al., 2023). These studies collectively underscore the transformative potential of AI in radiology while emphasizing the importance of addressing technical, organizational, and social dynamics for its successful implementation in hospital radiology departments.

The radiology department utilizes a diverse array of AI tools to streamline the routine tasks of radiologists, ensuring efficiency and comfort in completing their duties. To facilitate diagnostic procedures and patient care at KMC Hospital, radiographers, radiologists, and their assistants use a variety of tools in the radiology department. The 64-channel 3-Tesla MRI machine, which represents a significant advancement in medical imaging technology, the particular areas of the body can be image to these tools that radiologists and radiographers use with assistance .This machine offers exceptional imaging resolution and rapid scan durations, enhancing diagnostic accuracy for neurological disorders, musculoskeletal injuries, cardiovascular conditions, and oncological diseases (P. Mishra personal communication, June 7, 2023). Additionally, the machine's 64 receiver channels ensure detailed image capture with reduced artifacts, improving image quality, particularly in challenging scenarios.

Furthermore, the use of three DR X-ray systems by radiographers, supported by assistants, revolutionizes radiography with digital capabilities, enabling quick access to high-quality images and facilitating prompt diagnosis and treatment decisions (M. Mahat, personal communication, May 18, 2023). The digital approach of DR systems eliminates film processing and reduces imaging time, while also offering enhanced image quality and diagnostic accuracy through post-processing tools .Radiologists use mammography as a crucial tool for breast cancer detection, facilitating quick diagnoses and treatment interventions (R. Mahat, personal communication, May 18, 2023). CT scans, employed by both radiographers and radiologists with assistant support, provide detailed three-dimensional cross-sectional images of the body's internal structures, aiding in the diagnosis of various medical conditions, including tumors and vascular abnormalities (P. Mishra personal communication, June 7, 2023). The cardiac

catheterization laboratory that radiologists use has also grown to provide the accurate evaluations needed for surgical interventions aimed at cardiovascular diseases, with a focus on radiation safety (R. Mahat, personal communication, May 18, 2023).

Figure 4.3

AI in Radiology



Source: KMC Administration. The figure explain 3-Tesla Machine can detect particular problem of the patient source by Radiology Department of KMC Hospital.

Although operator expertise is necessary for reproducible images, ultrasound guidance, used by radiologists with assistant support, offers real-time visualization without ionizing radiation (R. Mahat, personal communication, May 18, 2023). Portable X-ray machines, C-arm machines, dental X-ray equipment, computers, smartphones, and metal detector machines are also utilized within the radiology department to optimize workflow efficiency, communication, and patient care while ensuring data security and compliance with privacy regulations (S. Ojha, personal communication, May 20, 2023). These tools are essential to acknowledge the contributions of these individuals and provide credibility to the information presented.

In the radiology department at KMC Hospital, various tools are utilized by radiographers, radiologists, and their assistants to facilitate diagnostic procedures and patient care. The 64-channel 3-Tesla MRI machine, supported by assistants, stands as a cornerstone tool, offering exceptional imaging resolution and rapid scan durations for neurological disorders, musculoskeletal injuries, cardiovascular conditions, and oncological diseases.

Table 4.7

AI in Radiology

Name of AI Tools	Quantity	User
64 channel 3-Tesla Machine	1	Radiographer and radiologist
DR Xray System	3	Radiographer
Mammography	1	Radiologist
CT scan	1	Radiographer and radiologist
Catheterization Laboratory	1	Radiologist
USG Machine	8	Radiologist
Portable USG	6	Radiologist
Portable Xray	8	Radiographer
C-arm	8	Radiographer
Dental Xray	1	Radiographer
Computer	5	Radiographer and Receptionist
Smartphone	24	Common
Metal Detector Machine	1	Receptionist /Assistant Radiologist
Total	68	

Source: KMC Administration. The table presents, within a cohort of 13 user groups, a total of 68 AI tools is utilized for performing daily tasks in radiolog. This indicates the diverse range of AI tools regularly employed within the radiology department.

Additionally, three DR X-ray systems revolutionize radiography with digital capabilities, ensuring quick access to high-quality images and prompt diagnosis. Radiologists rely on mammography for breast cancer detection, while CT scans provide

detailed three-dimensional cross-sectional images aiding in the diagnosis of tumors and vascular abnormalities and the cardiac catheterization laboratory supports accurate evaluations for cardiovascular diseases, emphasizing radiation safety. Ultrasound guidance offers real-time visualization without radiation, while portable X-ray machines, C-arm machines, dental X-ray equipment, computers, smartphones, and metal detector machines optimize workflow efficiency, communication, and patient care while ensuring data security and privacy compliance. These tools collectively contribute to the effectiveness and credibility of diagnostic procedures within the radiology department.

These tools synergistically enhance the efficiency and trustworthiness of diagnostic procedures within the radiology department. Yet, the growing incorporation of AI tools and automation in radiology precipitates a conflict in job sectors. Concerns loom over the potential replacement of human roles by these technologies, sparking fears of job displacement. This necessitates retraining or upskilling of personnel to navigate evolving practices and sustain relevance in the field among technological advancements.

4.5 Use of AI in Administration

The significant role of hospital administration and the transformative impact of technology, particularly AI, in healthcare management. Bhati, Deogade, and Kanyal (2023) emphasize the overarching goal of healthcare systems to provide high-quality care resulting in positive patient outcomes, recognizing the intrinsic connection between effective hospital administration practices and patient well-being. Taneja (2015) highlights the critical role of healthcare administrators in adapting to technology-driven changes, particularly in transitioning from paper records to digital systems, thereby improving operational efficiency and ensuring patient privacy.

Vyas, Gupta, and Shukla (2023, March) discuss the integration of advanced technologies like AI, machine learning, and edge analytics into contemporary healthcare administration, facilitated by collaborative efforts between government agencies and healthcare communities. They emphasize the potential of healthcare informatics in addressing various health-related issues and enhancing wellness management through the use of trustworthy AI models. Overall, the texts collectively

underscore the importance of leveraging technology, particularly AI, to optimize hospital administration and improve patient outcomes in the healthcare ecosystem.

Administration is a crucial component of KMC Hospital, where various AI tools are employed to streamline daily tasks efficiently and swiftly. These tools include the 5-billing machine that three accountants use to improve tax compliance, twenty computers that accounting and administrative staff use to optimize healthcare business processes through the HMIS and AIS, smartphones that all staff use for real-time data exchange, seven attendant machines that N. Dahal oversees for attendance management across all sectors, and five calculators that accountants use to simplify insulin dose calculation. Each of these tools plays a vital role in ensuring the smooth operation of the hospital among dynamic demands and challenges.

Table 4.8

AI in Administration

Name of AI Tools	Quantity	Users
Billing Machine	5	Accountant
Computer	20	Accountant/ Administrative
Smart Phone	616	Common
Attendant machine	7	All Job Holder
Calculator	5	Accountant
Total	653	

Source: KMC Administration. The table presents within five user groups; a total of 658 AI tools is utilized for administrative tasks in daily operations.

Different users use various tools in the administration of the KMC Hospital to facilitate effective operations and service delivery. Three accountants employ the 5-billing machine to enhance tax compliance, particularly in VAT, by creating a robust paper trail that aids revenue authorities. Proper citation for this function is attributed to P.P. Thapa (personal communication, May 9, 2023). Additionally, using insights from S. Ojha (personal communication, May 20, 2023), accountants and administrative staff use 20 computers to streamline healthcare business processes through the Hospital Management Information System (HMIS) and Administrative Information System

(AIS), improving internal efficiency and decision-making. Additionally, all staff members use smartphones, which serve as handheld computers, to facilitate real-time data exchange and transform healthcare management, according to S. Ojha (personal communication, May 20, 2023) trends in the uptake of healthcare smartphone applications (apps).

Under the direction of N. Dahal, seven attendant machines support attendance management across all KMC sectors, utilizing cutting-edge technologies like Ding Talk and Excel VBA for scheduling data processing (personal communication, July 10, 2023). Finally, the administration employs five calculators, particularly in insulin dose calculation, to streamline the process and improve accuracy, benefiting patient care and reducing healthcare waste, with insights from P. P. Thapa (personal communication, May 9, 2023). Each tool and its user's detailed function in administration are vital for efficient hospital operations and service delivery.

Various tools are utilized across different functions within the administration of KMC Hospital to enhance operations and service delivery. Three accountants employ the 5-billing machine to bolster tax compliance, particularly in VAT, by establishing a robust paper trail that aids revenue authorities. Accounting and administrative staff use twenty computers to improve internal efficiency and decision-making by streamlining healthcare business processes through the HMIS and AIS. Smartphones, utilized by all staff members, serve as handheld computers, facilitating real-time data exchange and transforming healthcare management. Seven attendant machines under the direction of N. Dahal support attendance management across all sectors of KMC, leveraging technologies like Ding Talk and Excel VBA for scheduling data processing. In order to streamline procedures, improve accuracy, and decrease healthcare waste, accountants use five calculators when calculating insulin doses. Each tool and its user's function in administration are essential for efficient hospital operations and service delivery, from tax compliance to attendance management and patient care enhancement.

Different users within the administration of KMC Hospital use various tools to improve operations and service delivery. Three accountants utilize the 5-billing machine to strengthen tax compliance, particularly in VAT, by establishing a robust paper trail that aids revenue authorities. Accounting and administrative staff use twenty computers to improve internal efficiency and decision-making by streamlining healthcare business processes through the Hospital Management Information System

(HMIS) and Administrative Information System (AIS). Smartphones, used by all staff members, serve as handheld computers, facilitating real-time data exchange and transforming healthcare management.

Under the direction of N. Dahal, seven attendant machines support attendance management across all sectors of KMC, utilizing technologies like Ding Talk and Excel VBA for scheduling data processing. Additionally, accountants employ five calculators, particularly in insulin dose calculation, streamlining the process to benefit patient care and reduce healthcare waste. Each tool and its user's function in administration are essential for efficient hospital operations, from tax compliance to attendance management and patient care enhancement, among conflicts in adapting to dynamic demands and ensuring accurate clinical diagnosis.

4.6 Use of AI in Security

The utilization of AI in various aspects of KMC healthcare focuses on enhancing safety, efficiency, and patient outcomes. Božić emphasizes the need to explore the preconditions, benefits, and challenges of AI-powered security systems in hospitals, as well as the ethical and legal implications of their implementation and the importance of considering the multifaceted aspects of AI integration in hospital security, including privacy concerns and human rights. Additionally, Gopalan, Raza, & Almobaideen (2021, March) highlight the transformative impact of technology, particularly IoT and AI, in revolutionizing healthcare processes, making them more efficient and secure. Their citation emphasizes the role of IoT and AI in real-time monitoring, medical analysis, and disease diagnosis, facilitating improved patient care and reducing doctor-patient visits.

Furthermore, Chen and Esmacilzadeh (2024) discuss the transformative potential of generative AI in healthcare while acknowledging the privacy and security risks it poses. Their citation stresses the importance of addressing these threats through robust data governance frameworks, secure infrastructure, and ethical guidelines to ensure safe and responsible use while safeguarding patient data and public trust. The significant strides AI is making in enhancing various facets of healthcare while also underscoring the critical need for ethical considerations and security measures in its implementation, and the discovery of concealed weapons in both general hospitals and

pediatric facilities, highlights the significance of hospital security and refutes the notion that children’s hospitals are immune to security risks.

The limited deployment of AI tools within KMC Hospital’s security infrastructure plays a pivotal role in maintaining its overall security. These selected tools are of paramount importance, significantly enhancing the hospital’s security measures.

Table 4.9

AI in Security

Name of AI Tools	Quantity	Users
Metal detector	2	Get keeper
Radio Set	6 set	Commander
CCTV Camera	150	Security chief
Smart Phone	44	common
Total	202	

Source: KMC Administration. The table presents, four distinct user groups utilized 202 AI tools for security maintenance in the hospital, while concurrently addressing privacy concerns within the hospital setting.

In contemporary hospital security practices, a multifaceted approach incorporating various technological tools is imperative to address evolving threats and ensure the safety of patients and staff. Metal detectors, deployed at entrances, play a crucial role in detecting concealed weapons and enhancing deterrence against potential violence, even within pediatric facilities where the perception of safety may be presumed (L. Lamichhane, Personal communication, July 11, 2023). Contrary to concerns about disruptions, public acceptance of these measures underscores their perceived efficacy in augmenting safety.

However, the efficacy of metal detectors in mental health contexts remains underexplored, necessitating further investigation. Likewise, radio frequency identification (RFID) technology emerges as a vital asset in hospital security, enabling efficient asset and patient tracking, thereby enhancing operational efficiency and patient safety (L. Gurung, personal communication, July 12, 2023). Volunteer amateur radio operators further bolster communication systems, ensuring reliability during

emergencies. Although initial costs may pose challenges, RFID's transformative potential in healthcare is evident, signaling its increasing adoption.

Additionally, closed-circuit television (CCTV) cameras, integrated into hospital security systems, offer surveillance capabilities, particularly crucial in psychiatric wards, albeit with ethical considerations regarding patient privacy (L. Lamichhane, Personal communication, July 11, 2023). Cloud computing and IoT frameworks further enhance CCTV functionalities, but challenges such as data compression and standardization persist. Moreover, smartphones have become indispensable tools for healthcare professionals, offering access to critical information and facilitating efficient communication (L. Lamichhane, Personal Communication, July 11, 2023). Despite their potential, the integration of smartphone-based sensors for enhanced security remains relatively nascent in hospital settings, indicating opportunities for further exploration and implementation. Standardized protocols aligned with best practices are essential to ensuring the effectiveness and ethical application of these security measures.

In contemporary hospital security practices, a multifaceted approach is essential, integrating various technological tools to ensure patient and staff safety. Metal detectors, strategically placed at entrances, serve to detect concealed weapons, even within pediatric facilities, where safety perceptions may be presumed, thus augmenting deterrence against potential violence. Radio frequency identification (RFID) technology plays a vital role in efficient asset and patient tracking, enhancing operational efficiency and safety, while volunteer amateur radio operators reinforce communication systems, ensuring reliability during emergencies.

Closed-circuit television (CCTV) cameras, particularly crucial in psychiatric wards, offer surveillance capabilities, though ethical considerations regarding patient privacy persist, and advancements in cloud computing and IoT frameworks enhance their functionalities. Smartphones have become indispensable for healthcare professionals, offering access to critical information and facilitating efficient communication, yet their integration for enhanced security remains nascent, signaling opportunities for further exploration. Standardized protocols aligned with best practices are crucial to ensuring the effectiveness and ethical application of these security measures.

In contemporary hospital security practices, various technological tools are integrated to ensure the safety of patients and staff, addressing evolving threats. Metal detectors, deployed at entrances, play a crucial role in detecting concealed weapons, challenging the perception of safety even within pediatric facilities. Despite concerns about disruptions, public acceptance of these measures underscores their perceived efficacy in augmenting safety. Despite their potential, the integration of smartphone-based sensors for enhanced security remains relatively nascent in hospital settings, indicating opportunities for further exploration and implementation.

Standardized protocols aligned with best practices are essential to ensuring the effectiveness and ethical application of these security measures. However, as technological advancements surge forward, traditional labor forces are being supplanted, and a substantial contingent of security personnel is being displaced. This transition exacerbates the scarcity of employment opportunities, sparking conflict. Inconsistencies in security practices between different sectors underscore the imperative for uniform protocols and broader integration of cutting-edge security technologies.

4.7 Use of AI in Housekeeping

The use of new technologies, particularly in the hospitality industry, is a prominent theme in the discourse surrounding housekeeping in hospitals. Sarkar et al. (2021) stress the potential benefits of leveraging technology in various aspects of hospitality management, including housekeeping, to enhance guest experience and foster future growth. Meanwhile, Ream et al. (2016) underscore the importance of proper waste management practices and continued training to ensure the occupational health and safety of hospital housekeepers. Additionally, Vance et al. (2022) delves into the integral role of hospital housekeepers in patient care, highlighting their historical significance and present-day involvement in healing environments.

Despite their significant contributions, housekeepers face challenges such as occupational stress and exposure to pathogens like SARS CoV-2. Considering these challenges, there is a growing need for further research and recognition of the role of housekeepers in healthcare settings (Messing et al., 1998). From the perspective of utilizing AI in hospital housekeeping, these citations emphasize the potential of technology to streamline tasks, improve safety measures, and enhance the overall

quality of patient care, aligning with the goal of creating intelligent hospitals where AI aids in optimizing various operational aspects, including housekeeping protocols and training programs. KMC Hospital operates a dedicated housekeeping department responsible for the cleaning and maintenance services throughout the facility, utilizing a variety of tools and equipment.

In KMC Hospital’s housekeeping operations, various tools are utilized by different personnel to ensure efficiency, cleanliness, and patient care. The department head employs a computer system for managing staff salaries and housekeeping records, facilitating workflow management and compliance

Table 4.10

AI in Housekeeping

Name of AI Tools	Quantity	Users
Computer	1	Department Head
Floor Grinder Machine	1	Swiper
Xsoni Systems Garments Finishing Equipment Washing Machine	4	Laundry Man
Automatic Hydro Extractor	2	Laundry Man
Xsoni Systems Drying Tumbler Machine	4	Laundry Man
Auto Clave Machine	5	Dust Keeper
Sewing Machine	2	Well-Wisher
Total	19	

Source: KMC Administration The table presents, seven user groups are utilizing 19 AI tools to efficiently accomplish routine tasks with ease, ensuring high quality and timely completion.

with safety protocols (R. Makaju, personal communication, August 5, 2023). Swiper utilizes a floor grinder machine, minimizing manpower costs and enhancing safety by efficiently maintaining cleanliness standards (S. Poudel, personal communication, August 6, 2023). Laundry staff rely on Xsoni Systems washing machines and hydro extractors to clean and sanitize garments swiftly, conserving resources and promoting infection control efforts (R. Makaju, personal communication, August 5, 2023).

Additionally, the use of Xsoni Systems Drying Tumbler Machines optimizes drying procedures, ensuring a consistent supply of fresh linens while saving costs and

promoting sustainability (R. Makaju, personal communication, August 5, 2023). Dust Keeper personnel utilize autoclave machines for effective sterilization, crucial for maintaining a safe, hygienic environment in accordance with healthcare standards (R. Makaju, personal communication, August 5, 2023). Furthermore, well-wishers employ sewing machines to promptly mend fabric tears and seams, extending the lifespan of essential items and supporting hygiene standards (R. Makaju, personal communication, August 5, 2023). Each tool serves a specific function, contributing to efficient resource utilization, safety, and service quality within the hospital.

Different staff members use various tools in the housekeeping department at KMC Hospital to maximize operations and uphold standards of cleanliness. The department head utilizes computers to manage staff salaries, store records securely, and facilitate communication across departments, enhancing efficiency and patient care. One staff member operates a floor grinder machine to effectively maintain cleanliness standards by removing surface flaws, stains, and debris from floors, reducing labor costs, and improving safety.

Laundry staff use Xsoni Systems garment finishing equipment, such as washing machines, hydro extractors, and drying tumbler machines, to effectively clean, sanitize, and dry linens, uniforms, and patient garments, promoting cost savings, environmental sustainability, and infection control. An autoclave machine is integrated into housekeeping for sterilization purposes, ensuring cleanliness and safety in medical settings. Staff members use sewing machines to promptly mend fabric tears and maintain textiles, extending their lifespan and supporting high hygiene standards. Overall, the integration of these tools into housekeeping operations at KMC Hospital optimizes efficiency, enhances safety, and contributes to a cleaner, healthier environment for patients, staff, and visitors.

In the realm of hospital housekeeping at KMC, various AI tools and machines are deployed to optimize operations. The department head employs computers for efficient management of staff salaries and housekeeping records, facilitating timely updates on tasks and inventory levels. Specialized software solutions streamline scheduling and quality assurance processes, ensuring compliance with safety protocols. The integration of a floor grinder machine proves highly effective in maintaining cleanliness standards with minimal manpower, reducing costs, and enhancing safety for patients and staff.

Additionally, garment finishing equipment, including washing machines and automatic hydro extractors, ensures the availability of clean garments while conserving resources and promoting infection control efforts. The use of drying tumbler machines further streamlines laundry management, ensuring a consistent supply of fresh linens. Moreover, the autoclave machine is crucial for sterilization, contributing to a safe and hygienic environment. Sewing machines enable efficient fabric maintenance, extending the lifespan of essential items. However, despite the benefits brought by these AI tools, conflicts may arise in job sectors as automation reduces the need for manual labor, potentially leading to job displacement or the need for reskilling among traditional housekeeping staff, highlighting the ongoing conflict between technological advancement and employment stability in various industries.

4.8 Use of AI in Driving

The application of AI in driving, as elucidated in the given texts, showcases the potential of AI technologies, particularly computer vision and machine learning, to revolutionize safety and efficiency in various domains. Yeung et al. (2018) emphasize the utilization of computer vision in healthcare settings to enhance patient safety by detecting deviations from clinical practices. Zeng et al. (2020) discuss the widespread adoption of robotics and AI in mitigating the spread of COVID-19, highlighting their role in hospitals, transportation systems, and public spaces.

Namatherdhala, et al. (2022) delve into the integration of AI into Intelligent Transport Systems (ITS), focusing on autonomous driving and the utilization of AI applications to enhance vehicle performance and decision-making capabilities. These texts underscore the transformative potential of AI in enhancing safety and efficiency across various sectors, including healthcare, pandemic management, and transportation (Murtaza et al. 2023). Various AI tools aid professionals in hospital transportation, enhancing efficiency and independence. These tools simplify tasks and expedite processes, enabling drivers to perform their duties swiftly and autonomously.

The integration of various tools plays a crucial role in driving hospital operations efficiently. Patient monitors, as employed at KMC Hospital, utilize advanced sensors and AI algorithms to track vital signs in real-time, aiding timely interventions, patient placement decisions, and remote monitoring, benefiting patients and staff alike (R. Mahat, personal communication, September 2, 2023). Thermometers are pivotal for

early fever detection and infection control measures, enabling prompt identification and isolation of contagious patients while also assisting in monitoring patient progress and ensuring optimal temperature management (R. Mahat, personal communication, September 2, 2023).

Pulse oximeters, utilized by drivers at KMC Hospital, provide real-time measurement of oxygen saturation and pulse rates, facilitating prompt identification of respiratory distress and guiding timely interventions, ultimately improving patient outcomes (R. Mahat, personal communication, September 2, 2023).

Table 4.11

AI in Driving

Name of AI Tools	Quantity	Users
Patient Monitor	3	Driver
Thermometer	3	Driver
Oximeter	3	Driver
Driver Display	3	Driver
Smart Phone	3	Driver
Total	15	

Source: KMC Administration. A user group utilizes 15 AI tools to streamline and optimize five different tasks involved in the regular driving process, making them more efficient and easier to perform through the integration of AI technology.

Driver displays, a remarkable leap in automotive technology, enhance safety and convenience for drivers by providing vital information within the line of sight, minimizing distractions, and improving overall awareness (O.A. Magar, personal communication, September 2, 2023).

Lastly, smartphones integrated into hospital settings enhance efficiency and communication among healthcare professionals, providing instant access to patient records, facilitating swift responses to emergencies, and extending healthcare services beyond hospital walls through telemedicine platforms (O.A. Magar, personal communication, September 2, 2023). Overall, the integration of these tools drives

improvements in patient care, safety, communication, and efficiency, aligning with the goal of excellence in healthcare delivery.

Various tools play essential roles in driving improvements across different domains, including healthcare and automotive technology. Patient monitors, integral in hospitals like KMC Hospital, utilize advanced sensors and AI algorithms to track vital signs in real-time, aiding timely interventions, patient placement decisions, and remote monitoring, thereby enhancing patient care, safety, and efficiency. Thermometers, also integrated into hospital operations, facilitate early fever detection, patient progress monitoring, and optimal temperature management, supporting infection control efforts and improving healthcare services. Pulse oximeters, similarly, integrated into hospital settings, provide real-time measurement of oxygen saturation and pulse rates, aiding in identifying respiratory distress and driving improvements in patient safety and respiratory care.

In the automotive sector, driver displays represent a significant leap forward, offering vital information and advanced safety features to enhance driver awareness and streamline driving tasks, ultimately elevating safety, convenience, and driving performance. Likewise, smartphones integrated into hospital settings optimize workflow, communication, and patient care outcomes by providing instant access to patient records, test results, and telemedicine platforms, thus contributing to high-quality healthcare delivery. These tools collectively underscore the importance of technological integration in driving operational effectiveness and service delivery across various fields.

Various AI tools serve crucial functions in different sectors, driving advancements and efficiencies in operations. In healthcare, patient monitors equipped with advanced sensors and AI algorithms, like those at KMC Hospital, track vital signs in real-time, aiding interventions and remote monitoring. Thermometers and pulse oximeters integrated into hospital settings support infection control efforts and respiratory care, respectively. Similarly, in the automotive sector, driver displays enhance safety and convenience by providing vital information and safety features.

Additionally, smartphones integrated into hospital settings optimize workflow and communication among healthcare professionals, improving decision-making and patient care outcomes. However, the integration of such AI tools also raises concerns

about potential conflicts in job sectors, particularly for low-skilled personnel, as automation may replace certain tasks traditionally performed by humans. This shift highlights the need for reskilling and upskilling initiatives to ensure the workforce remains relevant in an increasingly AI view, balancing technological advancement with job security and human expertise for KMC driving services.

4.9 Use of AI in Pharmacy

The integration of AI in pharmacy practice within hospital settings has become increasingly prominent, offering transformative potential for improving patient care. As outlined by Raza et al. (2022), AI technologies possess the capability to mimic human cognitive tasks and analyze data with precision, leading to valuable insights in drug therapy monitoring, interactions, and formulary selection, as well as aiding in clinical research and diagnosis assistance. This aligns with Al Meslamani's (2023) observations on AI platforms facilitating collaboration between pharmacists and clinicians, providing real-time updates on patient medications, and offering tailored drug therapies.

Furthermore, Das, et al. (2021) highlight the broader spectrum of AI applications in pharmacy, encompassing drug discovery, formulation development, and predicting pharmacokinetic parameters, which enhances effectiveness and cost-effectiveness in drug research. Despite concerns about potential job displacement, confidence in AI's efficacy contributes to its widespread adoption across industries (Mishra, 2018). The use of the latest AI technology has a different feature than in the past in hospital pharmacy, and regulatory enhancement of quality and quantity through embracing AI advancements not only improves patient outcomes but also empowers pharmacists to deliver superior, patient-centric care while staying at the forefront of technological innovation of the daily life.

The pharmacy employs various AI tools to streamline its daily activities, making tasks easier and more efficient. These tools facilitate the management of routine pharmacy tasks, ensuring smooth operations in the daily life of the pharmacy. In the pharmacy, three counters of accountants utilize nine computers, which are integral for optimizing medication management and enhancing efficiency, accuracy, and patient safety. These computers streamline tasks such as inventory control, prescription processing, and administration, reducing errors and improving workflow.

Decision support tools accessible through these computers provide pharmacists with instant access to critical patient data, aiding in informed decision-making and personalized care delivery (S. Adhikari, personal communication, September 17, 2023). Additionally, these systems' facilitation of electronic prescribing ensures seamless communication and adherence while supporting initiatives for regulatory compliance and quality improvement through data analysis. In the realm of financial management, six calculators utilized across the counters ensure precise medication dosing and compounding, crucial for patient safety and effective treatment.

Table 4.12

AI in Pharmacy

Name of AI Tools	Quantity	Users
Computer	3	Accountant
Calculator	6	Accountant
Billing Machine	3	Accountant
Smart Phone	10	Common
Total	22	

Source: KMC Administration. The table presents two user groups utilized 22 AI models across four distinct tasks to enhance the quality and accuracy of services within the pharmacy setting.

Pharmacists and technicians rely on calculators to compute drug dosages accurately based on patient parameters, which is essential for reducing medication errors (R. Tiwari, personal communication, September 17, 2023). Moreover, the billing machines employed by three different counters in the pharmacy play a pivotal role in ensuring seamless transactions and accurate financial management. These machines swiftly generate invoices for medications dispensed to patients, streamlining billing processes and minimizing errors (A. Yadav, personal communication, September 17, 2023). Simultaneously, smartphones, utilized by all staff in the pharmacy, modernize operations by facilitating efficient communication, access to medical resources, and real-time patient care coordination.

Medical apps and secure messaging platforms enable pharmacists to verify dosages, check for interactions, and counsel patients remotely, thereby promoting medication safety and enhancing patient-centered care delivery. Proper citation practices, as demonstrated through the personal communication references, ensure the appropriate acknowledgment of sources. Overall, the integration of these tools revolutionizes pharmacy operations, promoting safer and more effective patient care while marking a transformative leap forward in medication management.

In the pharmacy environment, various tools are employed across different functions to enhance efficiency, accuracy, and patient safety. Three counters of accountants utilize nine computers, integral to optimizing medication management through tasks like inventory control, prescription processing, and decision support, thereby reducing errors and improving workflow. Additionally, these computers facilitate electronic prescribing and aid in regulatory compliance and quality improvement initiatives. Six calculators utilized across the counters ensure precise medication dosing and compounding, crucial for patient safety, while three billing machines streamline transactions and financial management processes, minimizing errors and enhancing efficiency.

Furthermore, smartphones utilized by all staff modernize operations by facilitating efficient communication, access to medical resources, and real-time patient care coordination, promoting medication safety and patient-centered care delivery. Overall, the integration of these tools revolutionizes pharmacy operations, marking a transformative leap forward in medication management while reinforcing safety protocols and promoting operational effectiveness.

In the pharmacy, nine computers across three counters are integral to optimizing medication management, enhancing efficiency, accuracy, and patient safety. These computers streamline tasks such as inventory control, prescription processing, and administration, reducing errors and improving workflow. Decision support tools accessible through these computers provide pharmacists with instant access to critical patient data, aiding in informed decision-making and personalized care delivery, while electronic prescribing ensures seamless communication and adherence.

Meanwhile, six calculators used across the counters ensure precise medication dosing and compounding, essential for patient safety, while billing machines employed

by three counters ensure seamless transactions and accurate financial management. Smartphones, utilized by all staff, modernize operations by facilitating efficient communication, access to medical resources, and real-time patient care coordination, thereby promoting medication safety and enhancing patient-centered care delivery. However, while these technologies optimize pharmacy operations, there's a growing concern about the allocation of time for innovative cognitive pharmaceutical services among traditional tasks, indicating a potential conflict in job sectors as technological advancements reshape the role of pharmacists and technicians.

4.10 Discussion

AI technology is critically reliant upon experts for its proper use; implementation of AI is particularly relevant in healthcare today, as its more widespread use in medical practice is changing traditional practice. Secinaro et al. (2021) describe AI's role in the transformation of support for physicians and nurses with diagnosis, treatment plans, and clinical decisions. AI is able to process millions of data within seconds and generates high-quality feedback.

The adoption of AI into routine practice improves quality of care, reduces operational costs in time and money, results in clinical innovation, expands interdisciplinary research into new interdisciplinary areas, and can advance the development of healthcare policy in the future. Healthcare professionals appreciate AI's knowledge-based features, and this understanding also enables practitioners to understand how to use AI to integrate the systems in their discipline and continue with evidence-based practice.

AI does drive improvement in patient outcomes, especially in surgery and diagnostic imaging. At the same time, expert claims remain that AI will replace healthcare workers in their jobs (Tursunbayeva & Renkema, 2023). Regardless of such claims, AIs can assist in improving workforce outputs by developing service capacities with diminishable workforces, where the expert can focus on their complex tasks while increasing their respective bodies of knowledge and benefitting operations, efficiency, and effectiveness. Edison (2023) discusses that AI enables the possibility of accurate diagnosis and treatment to the right populations with timely delivery of primary, secondary, and tertiary care; however, the most important consideration is ensuring that

AI is aligning directly with moral, legal, and educational issues in healthcare while keeping patient safety, relationships, and trust intact.

The text in question highlights, while discussing the place of AI within pathology, particularly hospital pathology, the potential benefits and complications. In fact, Nakagawa et al. (2023) emphasize their belief that we should explore the use of AI tools to maximize diagnostics and treatment options while addressing data representativity, bias, explainability, security, and regulation. It could be exhibited that the intersection of pathology and AI landscapes showcases the various examples of AI systems trying to be marketed and the numerous complications with implementation, validation, and maintenance in a clinical environment. It discusses upstream issues such as data acquisition and algorithm training and downstream issues such as dataset shift and model readaptation.

The above text examines the introduction of artificial intelligence into pathology practice, with an emphasis on hospitals, that both presents opportunities and challenges. Nakagawa et al. (2023) advocate for the willingness to embrace AI tools to garner enhanced diagnosis and management options, while noting issues related to data inclusivity and bias, interpretability, security, and accountability. We can delineate the intersection between pathology and artificial intelligence, giving examples of AI systems being launched to market, along with related challenges regarding implementation, validation, and maintenance of AI in clinical environments. It also reveals broader upstream challenges, for example, data sourcing and algorithm training, and downstream challenges such as dataset shift and model recalibration.

However, AI integration within healthcare does present various challenges (Lee & Yoon, 2021), particularly issues around privacy, cybersecurity, data integrity, ethics, and equity. Which demonstrates the need for policies and guidelines for the responsible and proper use of AI within the healthcare services sector. In considering that AI technology undoubtedly represents great opportunities for the quality of healthcare as it is delivered, the possible outcomes and risks associated with AI technology for professionals and experts require a sensible approach considering the enormous implications.

Human factors, such as deskilling and burnout, and community issues like health equity and data inclusiveness, are also highlighted. It can emphasize that as much

as it is imperative to address biases in AI or the necessity of data governance and privacy-enhancing collaboration, it acknowledges the nascent stage of AI and that we may be only scratching the surface in developing AI responsibly and so that it can be utilized transparently and effectively. Colling et al. (2019) presents a framework for collaborative AI tool development in pathology, outlining the need for frameworks based on evidence that also meet regulatory guidelines.

The narrative, supported further by Forsch (2021), shows how medical institutions and their industry collaborators are working together in developing AI systems for diagnostics and therapeutics, as well as its position for continued growth within pathology implementation, and illustrates its transformational capabilities for diagnostic medicine.

The functionality of AI systems within pathology, built on digital pathology workflows and whole slide imaging (WSI) technologies, is a significant step towards the efficiency and reliability of disease diagnosis that will factor into the future of healthcare (Parwani, 2019). Researchers have shown that introducing next-generation technology in pathology will not only provide access to health services in rural communities but will also provide management of patient loads we see in places that won't necessarily be growing on resources.

The implementation of AI into pathology workflows, which incorporates digital pathology and WS technology, is an important step forward in this direction. AI algorithms can be combined with digital environments and medical record systems by healthcare providers to improve the accuracy and efficiency of diagnosing a disease, indicating a new chapter in the advancement of medical practice. AI can streamline the traditional model of pathology processes and can potentially revolutionize healthcare delivery models with the remote delivery of pathology slides and the ability to share and analyze pathology slides completely digitally, increasing access and quality of care.

In summary, the implementation of artificial intelligence in health care, especially for hospital-based pathology, provides exciting opportunities, workflows, capabilities, benefits, and solutions, but challenges, including ethical, legal, and social concerns involving social bias in data, a patient's privacy, cybersecurity, the workers, and health equity, must also be addressed. To pursue the potential of AI responsibly, transparently, and effectively, collaborative frameworks and regulatory foundations that

permit the use of AI technology must be established to inform the improvement and transformation of care and foster reproducible positive innovations within healthcare delivery.

CHAPTER V

USE OF ARTIFICIAL INTELLIGENCE AND CREATION, REPLACEMENT AND DISPLACEMENT OF EMPLOYMENT

The relationship between AI and employment and its correlation with levels of conflict, peace, and development, constitute the focus of this thesis. Through an investigation of AI utilization within the eight departments of KMC Hospital, this study examines the dynamics of employment creation, replacement, and displacement. The hospital's consistent augmentation of AI tools directly influences the employment view across these departments. The intertwined nature of quality service provision and employment outcomes within the hospital setting forms a critical aspect of this inquiry, illustrating the light on the nuanced impacts of AI integration on employment within KMC Hospital.

5.1 Introduction

The cognitive revolution, as outlined by Harari (2011), marks the genesis of human awareness regarding their environment and the challenges it presents. This newfound Intelligence instigated a necessity for protection, catalyzing the inception of adaptation mechanisms that began with the cognitive revolution. Due to inherent physical limitations, humans lacked natural defenses like horns or sharp teeth, prompting the innovation of tools as a means to confront and overcome adversities, thereby laying the groundwork for practical problem-solving strategies.

Subsequent to the cognitive revolution, the agricultural revolution further transformed human societies by tethering communities to fixed homelands. This transition engendered novel opportunities and complexities, fostering the development of cultural, religious, and property ownership concepts. In response to emerging challenges, humans sought power as a means of addressing communal obstacles, thus perpetuating a cycle of innovation and technological advancement aimed at enhancing efficiency and productivity through the continual refinement of tools, machinery, and automation processes. The changing rate of technology impacts the social order. Employment and important factor of society is studied in This section in the light of creation replacement and displacement in regards to AI.

5.2 Use of AI and Creation, Replacement and Displacement of Employment in Healthcare

AI tools are increasingly utilized within the healthcare sector to enhance patient services. However, the integration of these services with AI technology directly affects employment dynamics. This relationship between AI and employment has significant implications for levels of conflict, a topic explored further in the subsequent discussion.

5.2.1 Use of AI and Creation of Employment in Healthcare

The indispensable role of doctors and nurses in patient care surpasses the capabilities of AI, despite its ability to assist in medical analysis. AI lacks the capacity to grasp the complexities of human emotions and mental states, essential components of treatment (Jonson & Modani, 2021). Healthcare professionals' expertise is crucial for understanding patients' needs and delivering personalized care. Furthermore, while AI can aid in reviewing patient histories, the collaboration between healthcare professionals and AI drives advancements in medical technology.

Adding AI to healthcare makes professionals more ready to use its benefits and makes it easier for them to learn the skills they need to understand the results that AI generates, similar to how jobs that require less skill are replaced by jobs that require more skill (Jain et al., 2021). It is imperative to recognize that studies focusing on job displacement often overlook the concurrent emergence of new job opportunities due to technological advancements. The rapid expansion of clinical data in healthcare intensifies the strain on professionals, impacting their ability to deliver quality services amid work-related stress (Hazarika, 2020). Addressing this requires a reassessment of strategies to ensure staff satisfaction and support, with AI emerging as a promising solution to enhance provider performance.

Exploring AI's capabilities necessitates collaboration among stakeholders to navigate integration complexities, emphasizing accountability, transparency, and innovation (Clancy, 2020). As healthcare systems evolve, insights from managing complex systems offer valuable perspectives, while computational techniques in data science and analytics revolutionize insight extraction from vast datasets, empowering machines to learn and develop AI capabilities. AI is increasingly recognized as a valuable asset in addressing complex healthcare challenges (Alowais et al., 2023).

Managing Organizational Complexity aims to elucidate AI concepts, explore their resurgence, and illustrate their value in healthcare, promising to enhance patient care and quality of life with the evolution of AI technology, contingent upon equipping healthcare providers with necessary knowledge and tools.

The integration of diagnosis, treatment, and supportive AI at KMC Hospital's healthcare division has significantly transformed hospital services, with notable increases in both staffing and AI technology since 2015. In 2015, the KMC hospital employed 63 doctors and 98 nursing staff, figures that have since grown to 116 doctors and 328 nurses, aligning with the expansion of equipment and AI tools (Kathmandu Medical Collage, 2015). The introduction of new AI tools, such as robotic AI, has not only enhanced healthcare services but also created employment opportunities for various healthcare professionals, including doctors, nurses, technicians, and specialists at KMC (R. Mahat, personal communication, May 18, 2023). The hospital's commitment to leveraging AI technology is evident in its deployment of 51 AI tools aimed at optimizing patient care and treatment outcomes.

The utilization of AI tools by medical staff underscores their significance in improving service quality and patient flow within the hospital, with ongoing updates and expansions in equipment and AI technology contributing to this advancement (A. Thapa, personal communication, March 17, 2024). In 2015, the KMC hospital had 12 ventilators, which have now increased to 46. Patient monitors rose from 117 to 210 during the same period. Additionally, the number of ECG machines increased from 5 in 2015 to 15 in 2023. Defibrillators also saw a significant increase from 4 to 25 machines during this time frame. Similarly, the number of dialysis machines rose, illustrating not only the increase in the number of machines but also the growth in human healthcare personnel at the KMC hospital. A new board committee emphasized the need to improve healthcare technology in 2021. This led to the introduction of many new AI tools in diagnosis, treatment, and support areas.

These included syringe pumps, infusion pumps, incubators, fibro scans, robotic AI, and intelligent hearing systems. These installations aim to create new opportunities within these sectors (R. Mahat, personal communication, May 18, 2023). Dr. Thapa highlights the transformative role of AI tools in shaping patient confidence and facilitating accurate treatment, emphasizing the potential of these tools to enhance patient outcomes and instill confidence in medical interventions.

Despite the progress of AI technology, the indispensable role of doctors and nurses in patient care remains paramount, as they provide critical analysis, interpretation of medical data, and empathetic connections with patients, which AI tools cannot replicate (A. Thapa, personal communication, March 17, 2024). Thus, while AI technology continues to revolutionize healthcare delivery at KMC Hospital, the collaborative synergy between technology and human expertise ensures effective and personalized patient care, driving the hospital's commitment to embracing technological advancements while fostering professional growth opportunities for healthcare practitioners. The intelligent auditory system, slated for installation in 2021, aims to assess hearing issues.

This technology helps to create jobs by having audiologists oversee its implementation. Each sector will require additional manpower to manage the new equipment (R. Mahat, personal communication, May 18, 2023). The efficiency of AI tools accelerates patient care, delivering swift results and expedited services compared to non-AI methods. With rising patient numbers, there's a corresponding increase in doctors and nurses.

The integration of AI enhances service quality, thereby improving patient flow within hospitals (A. Thapa, personal communication, March 17, 2024). The hospital is significantly expanding its services to manage the influx of patients efficiently. According to CC camera records, between 50 and 55 patients are seen visiting every 5 minutes during mid-morning hours. The availability of doctors, nurses, and AI tools within the hospital affects the rate of patient flow. By 2023, the KMC hospital plans to have 51 AI tools, along with a staff comprising 116 doctors and 328 nurses, to better meet the healthcare needs of the community at KMC Place.

The integration of diagnosis, treatment, and supportive AI at KMC Hospital has catalyzed a notable transformation in healthcare services, evidenced by substantial increases in staffing and AI technology deployment since 2015. The hospital's commitment to leveraging AI is reflected in the expansion of equipment and the introduction of 51 AI tools, including robotic AI, aimed at optimizing patient care and treatment outcomes. While AI technology enhances service quality and patient flow, it is underscored that the indispensable role of doctors and nurses in providing critical analysis, empathetic connections, and personalized care remains paramount. The collaborative synergy between technology and human expertise ensures effective

healthcare delivery, fostering professional growth opportunities while meeting the evolving healthcare needs of the community at KMC Place.

The integration of AI technology within KMC Hospital's healthcare division since 2015 has resulted in significant transformations, including the creation of employment opportunities for various healthcare professionals. This integration has led to notable increases in both staffing and AI technology, aligning with the expansion of equipment and AI tools. The deployment of AI tools has not only optimized patient care and treatment outcomes but also contributed to the growth of employment opportunities within the healthcare sector at KMC Hospital. Despite the efficiency of AI tools in accelerating patient care and service delivery, the indispensable role of doctors and nurses in providing critical analysis, interpretation of medical data, and empathetic connections with patients remains paramount, ensuring effective and personalized patient care within the hospital setting.

Thus, while AI technology continues to revolutionize healthcare delivery and improve service quality at KMC Hospital, the collaborative integration of technology and human expertise serves to drive the hospital's commitment to embracing technological advancements while fostering professional growth opportunities for healthcare practitioners. The creation of new opportunities can create conflicts between new knowledge and new manpower to accumulate job opportunities. The few people who work in healthcare create class hierarchies in society, which creates another conflict through the development of technology.

5.2.2 Use of AI and Replacement of Employment in Healthcare

The emergence of AI prompts inquiries into its potential to supplant human roles, notably in psychiatry, impacting both technical and interpersonal dimensions. While AI holds promise in leveraging smartphone technology to collect and analyze extensive patient data for enhanced treatment outcomes, it also challenges the traditional empathetic exchanges inherent in psychiatry (Brown, et.al 2021). Despite AI's deficiency in human-like conversational skills, advancements in natural language processing hint at a future where AI agents foster therapeutic rapport. Yet, concerns persist regarding biases and value alignment in AI-led care.

Notwithstanding the enduring significance of human empathy underscores the integral role of human touch in psychiatric practice. Concurrently, the progression of

robotic technology introduces emotionally responsive robots, exemplified by Sophia, which signify enhanced functionality through technological strides (Robert, 2019). As robots assume nursing tasks, nurses can reallocate their focus to direct patient care, addressing existing inefficiencies.

Despite ongoing challenges like technology infrastructure, the integration of advanced AI tools enables nurses to deliver care across diverse settings, signifying a transformative shift in nursing practice amid technological evolution. The trajectory of AI development remains uncertain (Pepito & Locsin 2019), yet its progress suggests the potential to surpass human intellect, posing a threat to professions like nursing among a global shortage. With robots showcasing nursing functions and AI simulating nursing thought processes, nurses must embrace technology to remain pertinent and advocate for patient welfare amid potential obsolescence.

AI tools are revolutionizing the healthcare sector, demanding top-tier operations across various facets such as diagnosis, treatment, and supportive care. Rule-based AI and expert AI, managed primarily by field experts, set a standard for superior quality in healthcare delivery, requiring potential training for less skilled workers to operate effectively. As traditional knowledge and skills undergo a resurgence among healthcare professionals adapting to modern technological advancements, the integration of AI prompts a potential shift in the roles of doctors and nurses within the hospital setting. Newly installed AI-powered systems, such as two incubators, one fibro scan, one robotic surgery and neuro navigation system, and an intelligent hearing machine, show how things are changing and could lead to changes in healthcare job roles.

To address this shift, existing staff may undergo training, while the possibility of outsourcing for new expertise is also considered to maintain healthcare quality among technological advancements. A Thapa emphasized that training and expertise are essential for the successful use of machines like robotic surgery and neuro navigation systems in clinics (personal communication, March 17, 2024). Consequently, traditional treatment methods are gradually giving way to new technologies, streamlining patient care and reducing the time constraints on healthcare personnel while enhancing treatment quality. In 2021, the hospital introduced a fibro scan, supplanting traditional methods and personnel in the diagnostic department. This advanced technology renders traditional expertise and manual labor redundant in healthcare (A. Thapa, personal communication, March 17, 2024). Trained users and

nurses now fill the roles once occupied by traditional workers. The necessity for traditional personnel to operate modern technology is eliminated. R. Mahat emphasized that hiring is now based on updated criteria aligned with new knowledge demands (R. Mahat, personal communication, May 18, 2023). However, the transition to this new tool has proven challenging for existing staff, prompting their replacement with individual's adept at handling modern technology in healthcare settings.

The transformative impact of AI on the healthcare sector highlights its role in reshaping job roles and employment dynamics. AI tools, characterized by their demand for top-tier operations, are redefining various aspects of healthcare delivery, including diagnosis, treatment, and supportive care. This integration not only streamlines patient care but also reduces the reliance on traditional expertise and manual labor, rendering certain roles redundant. Despite the emphasis on training and expertise for the successful use of AI tools, the transition to this new technology poses challenges for existing staff, leading to their potential replacement with individuals who are adept at handling modern technology. This indicates a significant shift in healthcare job roles, where hiring criteria are updated to align with the demands of AI healthcare systems, marking a pivotal moment in the evolution of healthcare delivery.

In the KMC hospital, the transformative impact of AI on healthcare, where advanced technologies are increasingly replacing traditional methods and personnel, is leading to a significant shift in job roles and employment dynamics. While AI tools demand top-tier operations and set high standards for healthcare delivery, they also render traditional expertise and manual labor redundant, particularly in diagnostic departments. This scenario reflects a conflict between technological advancements and traditional employment practices within the healthcare sector.

The integration of AI prompts a potential displacement of doctors and nurses as machines take over tasks once performed by humans. Despite efforts to train existing staff, the transition to new technologies proves challenging, leading to the replacement of individuals with expertise in handling modern technology. This conflict between technology and employment underscores the need for healthcare professionals to adapt to evolving job roles and skill requirements aligned with the demands of AI healthcare delivery systems.

5.2.3 Use of AI and Displacement of Employment in Healthcare

Healthcare stands as a sector poised for significant transformation through AI, as highlighted by Benhamou (2020) in medico-technical robotics' increasing importance across biology, pharmacology, and surgery. The potential for AI to surpass human doctors in medical tasks like diagnoses, prognostic models, and surgical interventions, as noted by Goldhahn et al. (2018), is evident, with instances such as a robot achieving exceptional scores in China's national medical exam.

AI's technical prowess, driven by deep learning and machine learning, enables continual self-correction and integration of vast health data, potentially outpacing human capacity for knowledge acquisition and clinical reasoning. Moreover, AI systems offer economic advantages and increased accessibility compared to human medical staff. Despite AI's growing role, the text emphasizes the irreplaceable value of human doctors in understanding illness within its human context and providing holistic care. Meanwhile, according to Bajwa et al. (2021), AI's evolving role in healthcare indicates its potential to increasingly displace doctors and nurses in tasks such as diagnostics, treatment planning, and personalized care delivery, as it advances toward precision medicine and data-driven disease management models over the long term.

To adopt new technology, human labor isn't always necessary to complete tasks. This changing view is displacing roles in healthcare, yet the integration of new technology is crucial for expanding services and enhancing their quality. AI tools excel at handling extensive tasks autonomously, potentially displacing human operators in hospitals. With the ability to undertake massive responsibilities, these tools render human task operators redundant among patient caregivers (A. Thapa, personal communication, March 17, 2024). Despite the workforce dedicated to these tasks, a single machine can suffice, leading to a substantial reduction in the need for doctors and nurses, thus altering the healthcare view.

In scenarios where tasks are not human-performed, AI tools replace human involvement, rendering human efforts futile. A. Thapa contends that machines do not supplant doctors and nurses but rather aid them by processing machine-generated reports (personal communication, March 17, 2024). Although there may not be any overall displacement, there are some human tasks that machines are taking over, which is worrying for healthcare professionals. For instance, although doctors collect samples

from patients, AI-operated robots diagnose issues, reducing doctors' operational time (M. R. Khadka, personal communication, May 11, 2023). Thus, while machines augment healthcare processes, they also diminish the direct involvement of doctors and nurses, prompting a shift in traditional roles within medical settings. The integration of the latest AI technology makes these advancements possible, heralding a new era in healthcare delivery.

The use of AI in KMC Hospital highlights the transformative impact of AI on the healthcare sector, emphasizing its potential to displace human employment while enhancing service quality and efficiency. As AI tools excel at autonomously handling extensive tasks, they gradually render human operators redundant, thereby altering the healthcare view by reducing the need for doctors and nurses. While the integration of new technology is crucial for expanding services, it simultaneously leads to job displacement, raising concerns among healthcare professionals about the diminishing direct involvement of human workers.

Despite assertions that machines aid rather than replace doctors and nurses, the reality is that AI increasingly takes over tasks traditionally performed by humans, such as diagnosing medical issues. Consequently, there is a notable shift in traditional roles within medical settings as AI becomes more integrated. This integration marks a new era in healthcare delivery, where the potential of AI to streamline processes and improve outcomes is clear, yet it also brings about significant changes in employment dynamics and professional responsibilities within the healthcare workforce.

In the KMC hospital, there is a conflict between technology and employment in the healthcare sector as AI integration progresses. It acknowledges that while the adoption of new technology is essential for expanding services and improving quality, it also leads to the displacement of human operators in hospitals. The advancement of AI tools capable of autonomously handling extensive tasks is gradually making human task operators redundant, thereby reducing the need for doctors and nurses.

This displacement raises concerns among healthcare professionals about job security and the shifting view of their traditional roles. Although some argue that AI aids rather than replaces healthcare professionals, there is evidence suggesting that machines are gradually taking over certain tasks, diminishing the direct involvement of doctors and nurses. Consequently, while the integration of AI technology heralds a new

era in healthcare delivery, it also prompts a fundamental transformation in employment dynamics, emphasizing the need for adaptation and reevaluation of roles within the sector.

5.3 Use of AI and Creation, Replacement and Displacement of Employment in Pathology

AI tools have revolutionized laboratory operations, impacting both workflow efficiency and the roles of laboratory personnel in Nepal at Sinamangal. Since its inception alongside the hospital in 2003, the pathology department at KMC Hospital has continually evolved to meet the demands of an expanding patient base to support of technology. Initially comprising five staff members processing ten cases daily, the department has embraced a diverse array of AI tools, including analyzers, non-analyzers, and receptionist AI tools, to optimize its services.

These AI tools play a pivotal role in maintaining service standards and ensuring seamless operations within the hospital. As the hospital's service area expands and new challenges emerge, the effective utilization of AI tools becomes increasingly critical. This section aims to explore the intricate relationship between AI tools and laboratory employees, providing insights into how these technologies enhance patient care and streamline daily operations.

5.3.1 Use of AI and Creation of Employment in Pathology

According to Goldhahn et al. (2018), the integration of AI and machine learning (ML) with the expertise of pathologists and oncologists in digital pathology is pivotal for the advancement of diagnostic processes. Particularly machine learning and deep learning, revolutionize pathology by enabling the analysis of digitized slide images. With the advent of brightfield and fluorescent slide scanners, entire glass slides can now be virtualized and digitized, facilitating the storage of histopathology, immunohistochemistry, and cytology slides on cloud-based platforms for remote access and analysis. AI computational science categorizes and analyzes digitized slides, distinguishing between weak AI, focusing on specific tasks, and strong AI, aiming for broader intelligence.

Machine learning, a subset of AI (Cui & Zhang, 2021), enables computer systems to learn and improve from data without explicit programming, while deep learning, based on artificial neural networks (ANNs), interprets complex data patterns

such as cancer cells and cell nuclei. Convolutional neural networks (CNNs), a type of deep learning architecture specialized for image analysis, processing, and classifying digital images effectively. Moreover, AI approaches serve as decision support systems for oncologists, aiding in patient management and treatment decisions, particularly in cases of intra-tumor and inter-tumor heterogeneity.

These improvements in AI-based biomarker methods make it easier to choose the right patients for new medicines, which saves money and reduces side effects on the body while increasing clinical benefit in precision medicine. The impending transformation of clinical practice through artificial intelligence promises to revolutionize histopathology in the coming decade (Colling et al. 2019), necessitating the establishment of a robust framework for collaborative development and regulatory approval, as initiated by initiatives like the NCRI Cellular Molecular Pathology (CM-Path) and the British In Vitro Diagnostics Association (BIVDA).

Laboratory technicians facilitate the use of various AI tools in pathology laboratories to improve daily operations. These tools require human labor to perform tasks effectively. M. R. Khadka highlights a significant surge to 600 daily samples, necessitating the integration of AI technology to enhance pathology service delivery (personal communication, May 11, 2023). Failure to upgrade technologically might strain the existing 34-member staff, hindering their ability to meet the escalating demand effectively. The changing environment emphasizes the need for AI adoption by necessitating streamlined operations to effectively handle the increasing workload. Semi-auto analyzers like the beacon semi-auto analyzer are an example of how initial reliance on non-analyzer AI tools required a lot of space and human intervention for sample testing (A. T. Magar, personal communication, May 12, 2023).

However, advancements have led to the adoption of Analyzer AI tools like the Beckman Coulter AU480 Machine, capable of processing 900 samples per hour, significantly improving efficiency over previous machines (A. T. Magar, personal communication, May 12, 2023). Despite technological advancements, human staff remain indispensable, especially in result interpretation to ensure accuracy and reliability among rising cases (M. R. Khadka, personal communication, May 11, 2023). Staff proficiency in operating machines through thorough training highlights the symbiotic relationship between human expertise and technological innovation,

optimizing overall performance and patient care quality (M. R. Khadka, personal communication, May 11, 2023).

Government policies play a role in job creation for laboratory technicians, although modern technology reduces the need for a large workforce (A. T. Magar, personal communication, May 12, 2023). In the reception area, direct human interaction remains irreplaceable, as machines lack the capability to understand emotions and establish personal connections (S. Karki, personal communication, May 24, 2023). Thus, while AI tools enhance efficiency and productivity in pathology labs, they complement rather than replace human expertise, ensuring optimal service delivery and patient care.

The pathology department of KMC faces a significant surge in demand, escalating to 600 samples daily, necessitating the integration of AI technology to manage the workload effectively by the nature of technology. The transition from non-analyzer AI tools to advanced analyzer AI tools like the Beckman Coulter AU480 Machine highlights a shift towards automation for sample analysis, significantly improving efficiency and accuracy of the sample report. Despite technological advancements, human involvement remains crucial for interpreting results, emphasizing the symbiotic relationship between staff and machines.

Training staff to proficiently operate these advanced machines ensures optimal performance and underscores the indispensable role of skilled personnel in healthcare diagnostics. Furthermore, while technology enhances operational capabilities within the lab, it cannot entirely supplant human interaction, particularly in reception areas where direct communication with visitors requires human receptionists. Thus, a collaborative approach between humans and technology emerges as essential for navigating the evolving view of pathology services, ensuring both efficiency and quality in healthcare delivery.

The critical role of AI tools in enhancing pathology services amid escalating demand, with a notable increase in sample testing necessitating technological upgrades to meet the workload effectively, the integration of AI tools like the Beckman Coulter AU480 Machine has significantly improved processing efficiency, reducing turnaround times and increasing throughput. However, it highlights a conflict regarding the reliance on technology versus human expertise.

While machines enhance productivity, human intervention remains indispensable for tasks beyond machine capabilities, such as result interpretation and maintaining a personalized connection in reception areas. The scenario portrays a delicate balance between embracing technology for efficiency while recognizing the irreplaceable role of human expertise in healthcare diagnostics and patient interaction. This conflict underscores the need for a collaborative approach where humans and machines complement each other to ensure optimal service delivery and patient care.

5.3.2 Use of AI and Replacement of Employment in Pathology

The discourse begins by addressing criticisms faced by AI approaches, particularly those based on deep learning, for their lack of transparency in decision-making processes, which raises concerns about their efficacy in clinical settings. While efforts are underway to enhance algorithmic interpretability, regulatory bodies like Europe's General Data Protection Regulation (Niazi et al., 2019), may impose restrictions on automated decision-making in healthcare. Despite speculation, AI is not expected to fully replace pathologists but rather complement their expertise, as emphasized by Granter et al., (2017), who underscore the unique interpretive skills of human microscopists in pathology alongside AI technology.

The main theme delves into the advancements and challenges in digital pathology (DP) and its implications for the field, highlighting the pathologist's crucial role in diagnosing pathological changes and the integration of computer algorithms to enhance precision in assessments Pallua et al., (2020). Despite hurdles such as high costs and regulatory issues, DP holds promise for improving diagnostic accuracy and treatment planning, particularly in multidisciplinary tumor board conferences. While whole slide imaging emerges as a promising technology, its adoption is hindered by regulatory concerns and technical complexities. Nonetheless, digitalization is expected to revolutionize tissue analysis and diagnostic methods in the future.

In the pathology department of the hospital, the integration of analytical AI tools has replaced conventional non-analyzer AI technology, as exemplified by the adoption of the Beckman Coulter AU480 machine, which supplants the previous Vchem Next biochemistry analyzer semi-auto machine. The Beckman Coulter AU480 Machine, capable of processing 900 samples per hour, represents a substantial advancement over its predecessor, as evidenced by a significant reduction in result time from four hours

to mere minutes (A. T. Magar, personal communication, May 12, 2023). This transition marks a shift towards expert AI systems, surpassing rule-based AI, and yielding consistently accurate results with minimal errors, thereby reducing reliance on human technicians in the analysis process, as advocated by the lab director (A. T. Magar, personal communication, May 12, 2023).

Despite the machines operating below capacity due to increasing workload demands, Magar suggests optimizing operational efficiency by streamlining the workforce, potentially halving the current technician count in alignment with regulatory flexibility (A. T. Magar, personal communication, May 12, 2023; Nepal Public Health Laboratory regulations). Moreover, while the surge in patient cases underscores the importance of existing staff, the correlation between staff size and caseload remains inversely proportional, necessitating the need for skilled human technicians to interpret machine-generated results and mitigate potential errors (M. R. Khadka, personal communication, May 11, 2023). Although initially challenging, staff proficiency in operating the new machine improves through comprehensive training, ultimately enabling a symbiotic relationship between human expertise and technological innovation, thereby enhancing overall diagnostic performance and patient care quality (M. R. Khadka, personal communication, May 11, 2023).

The transition within a hospital's pathology department from traditional non-Analyzer AI technology to more advanced Analyzer AI tools is exemplified by the adoption of the Beckman Coulter AU480 Machine. This shift signifies a move towards automation, significantly reducing the need for human technicians in the analysis process while enhancing result accuracy and efficiency. The lab director suggests that the current workforce exceeds operational requirements, proposing a reduction in staff numbers by half to align with the enhanced capabilities of the technology. Despite the growing workload, the director emphasizes the importance of regulatory flexibility to optimize resource utilization.

However, there's a recognition of the ongoing necessity for human involvement in result interpretation due to the potential for errors in machine-generated results. The symbiotic relationship between human expertise and technological innovation in healthcare diagnostics emphasizes how staff members initially find the new technology challenging but eventually adapt through thorough training, leveraging the machine's capabilities to augment their own. This narrative underscores the pivotal role of

advanced technology in streamlining operations, optimizing efficiency, and ultimately improving patient care, while also prompting a reassessment of workforce requirements in light of technological advancements in Nepal.

The dynamic scenario is where technology, particularly advanced AI and analytical machines like the Beckman Coulter AU480, supersedes traditional methods in pathology departments, leading to increased efficiency and accuracy in patient sample analysis. This transition prompts a conflict between technology and employees as advanced machines replace the need for human technicians in the analysis process, suggesting a potential reduction in staff numbers for operational efficiency. However, it also highlights the indispensable role of human expertise in interpreting machine-generated results, emphasizing the necessity of a balance between technological advancement and human intervention in healthcare diagnostics.

While machines enhance operational capabilities and efficiency, staff proficiency in machine operation ensures the optimal utilization of technology to augment their own expertise, ultimately advancing the quality and reliability of patient care. This intricate interplay between technology and employees underscores the evolving view of healthcare diagnostics, where regulatory flexibility and continuous training are pivotal for maintaining service standards while maximizing efficiency and resource utilization.

5.3.3 Use of AI and Displacement of Employment in Pathology

The rapid digitization of tissue slides and the advancements in artificial intelligence, particularly deep learning, propel computational pathology into automating clinical diagnoses, predicting patient outcomes, and identifying new biomarkers (Song, et.al, 2023). While some AI-based systems gain approval for clinical support, significant technical barriers impede their wide adoption in clinical settings and integration as research tools. Recent methodological breakthroughs in computational pathology, concentrating on predicting clinical outcomes using whole-slide images, highlight how these advancements streamline clinical practices and unearth novel biomarkers. Moreover, the review explores future prospects as computational pathology broadens its scope, integrating diverse clinical data modalities.

Digital pathology (DP) revolutionizes histopathology (Jahn et al.,2020), enabling real-time sharing of digitized images and video streams for telepathology and educational purposes. Advanced computational pathology (CPATH) leverages machine learning (ML), enabling AI to link images with clinical data for prognosis and mutation analysis. Despite these strides, challenges such as substantial IT infrastructure investments, regulatory compliance, concerns regarding AI's decision-making process, and increased screen time for pathologists hinder progress.

However, digital pathology offers vast potential, mirroring radiology's advancements, as large-scale digitization becomes available. While AI's application in pathology remains nascent compared to radiology (Van et al., 2022), the introduction of digital slide scanners signals a pivotal transition toward full digital integration, albeit limited globally. This overview of AI in pathology delves into potential benefits and drawbacks, speculating on AI's future role in pediatric pathology, underscoring the transformative impact of automation on the pathology profession.

The hospital's pathology department has significantly evolved, leveraging AI technology for patient sample analysis, thus transforming traditional manual tasks into automated processes. Advanced microscopes and auto-scanning machines, such as the BECKMAN COULTER AU480, have augmented human efforts, operating autonomously and effectively replacing manual intervention in sample analysis (A. T. Magar, personal communication, May 12, 2023). This technological shift has implications for employment, as manual tasks within the lab are gradually being phased out, leading to a potential displacement of human workers.

Despite the increased efficiency and accuracy offered by AI tools, the transition presents a challenge in optimizing machine utilization to meet the growing demand for lab services (A. T. Magar, personal communication, May 12, 2023). Magar's contention regarding the excess of staff numbers underscores the need for regulatory flexibility to align workforce size with operational needs while maximizing efficiency and resource utilization (A. T. Magar, personal communication, May 12, 2023). Although the volume of samples processed per day has increased significantly, the total staff count in the pathology department remains unchanged, highlighting the discordance between technological advancements and workforce management at KMC (A. T. Magar, personal communication, May 12, 2023). This juxtaposition underscores the complex

interplay between AI integration, employment dynamics, and operational efficiency within the healthcare sector.

The clear trend of AI technology, particularly in the form of advanced laboratory equipment and automated processes, is displacing employment opportunities for human workers within the hospital's pathology department. Initially reliant on manual tools and a smaller workforce, the department now heavily incorporates AI machinery such as the Beckman Coulter AU480 Machine, which operates autonomously and significantly increases processing rates and accuracy. Due to the automation of previously performed tasks by technicians, there is less need for human intervention as a result of this technological advancement.

Despite the increase in the number of samples processed per day, the overall staff count remains static, suggesting that while technology enables higher throughput, it also reduces the need for additional human labor. Additionally, the lab director proposes a substantial reduction in staff numbers, highlighting a strategic move towards a leaner workforce enabled by technological advancements. This emphasizes the difficulty that employees have adapting to a world where their jobs are becoming more and more automated, potentially resulting in job displacement and necessitating a reevaluation of workforce management strategies to keep up with developing technological capabilities.

The hospital's pathology department undergoes a significant transformation with the integration of AI technology, particularly in sample analysis, displacing manual tasks and gradually reducing the need for human intervention. Advanced machines like the BECKMAN COULTER AU480 Machine showcase enhanced processing capabilities and accuracy, heralding a new era in diagnostics. Despite the efficiency that AI has brought, there is a conflict because the department must choose between the rising demand for lab services and the desire to maximize operational efficiency through workforce reduction.

While the technology enables the department to handle a larger volume of samples, the current staff size remains unchanged, indicating potential job displacement and underscoring the delicate balance required to navigate the integration of technology and human labor in healthcare diagnostics. This conflict highlights the necessity for regulatory flexibility to align workforce size with operational needs while maximizing

efficiency, emphasizing the complex interplay between technological advancement and employment dynamics within the healthcare sector.

5.4 Use of AI and Creation, Replacement, and Displacement of Employment in Radiology

The development of technology has also impacted the radiology department and the employment within it. Modern technological advancements in radiology have made tasks that were previously impossible for humans to perform possible, thereby playing a significant role in human services. The growth of this field has had both positive and negative effects on employment in the sector, which can be observed in the wider society.

5.4.1 Use of AI and Creation of Employment in Radiology

The increasing demand for radiology services due to an aging population has created a significant employment opportunity for radiologists, yet a shortage of qualified individuals persists. Misconceptions about AI replacing radiologists discourage medical students (Khurana et. al 2021) from pursuing careers in the field; however, AI introduces new prospects by assisting in tasks like workflow organization and image interpretation. Educating medical students about AI's evolving role in radiology can rectify misconceptions and inspire more students to pursue this crucial career path.

The integration of AI into radiology offers fresh job opportunities, emphasizing the need for interdisciplinary collaboration among radiologists, software engineers, and data scientists (Martín-Noguer et al. 2021). While each team member brings unique expertise, knowledge gaps exist, underscoring the importance of close cooperation to ensure effective development and integration of AI in radiology. The integration of AI into digital radiology signifies a transformation in radiologists' workflow, but it does not render radiologists obsolete; instead, it reinforces their role in interpreting complex cases and making patient care decisions. Nonetheless, radiologists must adapt by acquiring new competencies and understanding AI's limitations. Giansanti et al (2022). explores the challenges and ethical dilemmas associated with AI's integration into healthcare, offering insights into the evolving view of radiology as a profession.

The hospital's initial adoption of technology required a workforce of 20 staff members to efficiently manage equipment operations, but the introduction of new AI

technology has shifted the demand towards skilled manpower capable of effectively handling its operational tasks (R. Mahat, personal communication, May 18, 2023). Consequently, uneducated and unskilled workers are considered redundant, as the department has consistently prioritized skilled manpower since its establishment.

Adding AI technology has created new jobs that are specifically for setting it up and running it. For example, when the 64-channel MRI tool was added, it created new jobs that needed skilled workers who could both run the tool and analyze the images it produced (P. Mishra, personal communication, Jun 7, 2023). While there is adequate manpower available to manage this technology, it is imperative that they undergo the necessary training to acquire the specific skills required for machine operation.

Presently, efforts are underway to train existing staff members to meet the demands posed by operating this advanced technology, ensuring that the department remains equipped to handle the evolving view of radiology services. In 2021, the hospital installed a cath lab, an MRI machine, a mammography unit, a CT scanner, six pieces of portable ultrasound machines, and eight pieces of portable x-ray machines, all of which require skilled workers proficient in their usage (P. Mishra, personal communication, Jun 7, 2023). To meet this demand, the hospital provided reskilling or training to existing staff members, enabling them to efficiently operate these machines and provide optimal service to patients.

This influx of new manpower is fulfilling the training requirements, marking a new era of employment creation in radiology. The intricate nature of the machines necessitates acquiring new knowledge to handle these tools effectively, representing a paradigm shift in job creation dynamics. The installation of the MRI machine demonstrates how existing manpower can effectively operate advanced technology, showcasing the capability of current personnel to handle sophisticated equipment.

The AI technology in the hospital's radiology department has not only transformed operational processes but also created new avenues for employment. While the initial adoption of technology required a sizable workforce, the introduction of AI has shifted the demand towards skilled manpower capable of efficiently handling its operational tasks. This shift has led to the creation of new job roles dedicated specifically to the setup and operation of AI-powered equipment, such as the 64-channel MRI tool.

The KMC hospital has undertaken efforts to train existing staff members to meet the demands posed by operating this advanced technology, ensuring that the department remains equipped to handle the evolving view of radiology services. Additionally, the installation of various advanced imaging machines, including the cath lab, MRI machine, mammography unit, CT scanner, and portable ultrasound and x-ray machines, has created a demand for skilled workers proficient in their usage. To meet this demand, the hospital has provided reskilling or training to existing staff members, marking a new era of employment creation in radiology. This influx of new manpower not only fulfills the training requirements but also represents a paradigm shift in job creation dynamics, showcasing the capability of current personnel to handle sophisticated equipment effectively.

The AI technology in the KMC hospital radiology department has sparked a dynamic shift in employment dynamics, initially leading to the redundancy of uneducated and unskilled workers while creating demand for skilled personnel capable of operating and analyzing advanced imaging equipment. The introduction of technologies like the 64-channel MRI machine and the cath lab has prompted the creation of new job roles specifically tailored to their setup and operation.

Consequently, efforts are underway to train existing staff members to meet the demands of these technologies, ensuring the department remains equipped to handle evolving radiology services. While the installation of various advanced machines has created opportunities for employment, it has also underscored for the KMC hospital the need for ongoing training and upskilling to effectively utilize these tools. The scenario exemplifies the conflict between technology and employment, wherein the integration of AI creates new job opportunities but also requires a skilled workforce capable of navigating and maximizing its potential.

5.4.2 Use of AI and Replacement of Employment in Radiology

From an AI perspective, Brandes et al. (2020) explore the evolving dynamic between AI technology and the role of radiologists in healthcare. The advancement of AI in image analysis has sparked uncertainty regarding the future trajectory of radiology, prompting medical students to reconsider their career paths. However, Olthof et al., (2020) underscore that AI's primary aim isn't to entirely supplant radiologists but rather to complement and support them in their professional duties. There are currently

54% of AI applications in neuroradiology that are meant to help radiologists with finding abnormalities, interpreting findings, and sending quantitative data.

However, 14% of these apps offer features that could make them unnecessary for certain tasks, like writing preliminary reports. Yet, these applications are in their infancy stages and possess inherent limitations. It is evident that AI isn't poised to wholly replace radiologists; rather, its role is envisioned as augmentative, enhancing their efficiency and providing supplementary insights. However, challenges such as access to comprehensive datasets and ensuring the generalizability of AI algorithms across diverse populations persist, underscoring the necessity for continued research and collaboration. As Thrall (2018) noted, the success of AI in radiology depends on its capacity to produce real value for both patients and healthcare professionals.

Initially, the radiology department operated with a team of 20 members, gradually replacing them with skilled personnel over time (R. Mahat, personal communication, May 18, 2023). As AI technology progresses, the department witnesses the emergence of new skilled manpower, leading to a reduction in the original staff count from 20 to 5 individuals who are proficient in operating AI tools efficiently (P. Mishra, personal communication, Jun 7, 2023). While AI technology aids in streamlining certain tasks, it has not reached the point of entirely replacing radiologists, serving primarily to assist rather than supplant them. For instance, AI can efficiently handle repetitive procedures like mammography screenings, allowing radiologists to dedicate their expertise to more complex cases.

The evolution of technology eliminates the need for a dispatcher, with existing manpower now managing tasks previously handled manually. Physical labor, once indispensable for X-ray procedures, is now rendered unnecessary due to technological advancements. The sophistication of modern machines eliminates the need for a separate room to prepare X-ray negatives, effectively replacing labor-intensive processes with streamlined, automated solutions (R. Mahat, personal communication, May 18, 2023). As technology continues to advance, the role of skilled personnel in the radiology department evolves to adapt to these transformative changes, ensuring efficient and effective service delivery. Before 2021, the installation of the metal detector machine in radiology replaced the need for manual body checks by a single person.

Smartphones facilitate direct communication, reducing the number of calls and expediting processes. The MRI machine, serving multiple functions, replaces various other tools in its support, thereby also displacing other workers involved in those tasks. This integration results in the replacement of both technology and manpower. Portable x-ray and ultrasound machines replace the need for manual patient transportation and supplant wheelchairs.

According to Thapa, the cath lab represents another advanced technology capable of performing complex surgeries with minimal surgeon assistance. While surgeons can typically handle two hands and tools during surgery, cath lab technology can manage six to eight tools simultaneously through a small incision, enhancing efficiency and service quality (A. Thapa, personal communication, May 13, 2023). This implies that the use of cath lab technology can directly replace three to four surgeons from the surgical process.

A significant change in the radiology department brought about by the integration of AI technology, has led to the replacement of traditional employment roles. The department started out with a team of 20, but over time reduced its workforce to just five skilled workers who were proficient in using AI tools. While AI aids in streamlining tasks, it primarily serves to assist rather than fully replace radiologists, allowing them to focus on more complex cases. The evolution of technology eliminates the need for manual labor in tasks such as X-ray procedures and film preparation, effectively displacing roles previously necessary for these processes.

Moreover, advanced machines like MRI and cath lab technology can perform multiple functions and surgeries, respectively, reducing the need for additional personnel. This integration of technology not only streamlines processes but also directly replaces manpower, exemplifying the transformative impact of AI on radiology employment. Additionally, smartphones and portable imaging devices further contribute to the displacement of traditional roles by facilitating direct communication and eliminating the need for manual patient transportation. Overall, as technology advances, the radiology department must adapt to these changes, resulting in a shift towards more specialized roles focused on efficiently leveraging AI tools for enhanced service delivery.

The gradual but definitive shift in the radiology department's workforce dynamics due to the integration of AI technology highlights a scenario of conflict between technological advancement and traditional employment roles. Initially comprising a team of 20 individuals, the department gradually transitions to a leaner workforce of only 5 highly skilled personnel proficient in operating AI tools efficiently. While AI serves to streamline certain tasks, it hasn't completely replaced radiologists but rather assists them, allowing them to focus on more complex cases.

However, technological advancements have led to the displacement of certain roles, such as dispatchers and manual laborers, with existing manpower now managing tasks that were previously manual. Modern machines have automated processes such as X-ray imaging, eliminating the need for separate rooms and manual preparation of X-ray negatives. Moreover, advanced technologies like MRI and cath labs replace various other tools and roles, leading to a reduction in the overall workforce required for surgical procedures. This scenario underscores the evolving nature of employment in the face of technological progress, wherein the integration of AI and advanced machinery reshapes traditional roles and necessitates the acquisition of new skills for efficient service delivery.

5.4.3 Use of AI and Displacement of Employment in Radiology

From the perspective of AI, the potential to replace radiologists' looms on the horizon, driven by my capacity to analyze vast datasets, identify abnormalities, and manage complex data more effectively than humans (Chockley, & Emanuel, 2016). While existing applications like computer-aided detection already rival experienced radiologists, my continuous learning and enhancement, energized by increased data access and computing power, further solidify this potential.

The evolving view, marked by healthcare deinstitutionalization and payment reforms (Pesapane et al., 2018), coupled with the decreasing demand for imaging, could diminish the appeal and viability of radiology as a field over time. However, challenges such as human acceptance and legal considerations remain to be addressed as machine learning continues to reshape radiology (Ahuja, 2019). Conversely, radiologists who embrace AI and harness its capabilities position themselves for success in this changing environment. Collaborating with AI developers enables them to refine algorithms and

ensure the ethical and responsible integration of AI in healthcare, ultimately enhancing patient care and diagnostic accuracy.

The Performance and Talent (PAT) system represents a transformative leap in healthcare access, providing patients with seamless digital access to medical services from any location (R. Mahat, personal communication, May 18, 2023). Patients can now access their health reports remotely through digital platforms, offering unparalleled convenience and reliability across multiple healthcare facilities.

This innovative service efficiently manages patient influx for report retrieval, significantly reducing paper waste and associated investments (P. Mishra, personal communication, Jun 7, 2023). By transitioning to digital reports, hospitals not only minimize environmental impact but also ensure swift and accurate service delivery, marking a fundamental departure from traditional paper-based processes. The PAT system's digital platform thus emerges as a cornerstone of streamlined healthcare access, fostering environmental sustainability while enhancing overall service efficiency in healthcare facilities.

As AI technology continues to advance, it presents a paradigm shift in the field of radiology, potentially replacing certain roles and automating functions traditionally performed by radiologists themselves (J. K. Dash, personal communication, May 28, 2023). This evolution prompts healthcare professionals to adapt and reevaluate traditional practices in response to technological innovations. The demand for radiologists has evolved towards a specialized cadre proficient in operating AI systems effectively.

While the overall number of radiologists has diminished, the need for highly skilled individuals capable of managing AI technology has emerged as a critical requirement. This paradigm shift underscores the dynamic nature of radiology practices, where expertise in AI integration becomes indispensable for efficient service delivery and diagnosis in the modern healthcare view (P. Mishra, personal communication, Jun 7, 2023). In response to the digital revolution, hospitals now offer digital X-ray services, replacing conventional paper-based reports. Patients can conveniently access their reports remotely through personal smart devices, ensuring accessibility and precision.

These digital reports not only minimize the risk of misplacement or loss but also enhance household organization and reduce conflicts associated with document handling. Patients can effortlessly access their reports at any time, streamlining the healthcare experience and promoting patient autonomy and self-care. The integration of digital platforms reflects a commitment to efficiency, accuracy, and patient-centric care within hospital settings, further enhancing the overall healthcare experience. The advancement of AI technology in radiology has direct implications for operational processes, rendering the need for dispatchers obsolete. Compact and efficient AI systems require minimal space for installation, significantly reducing the demand for cleaners to maintain radiology rooms.

The streamlined approach facilitated by AI technology highlights its transformative impact on operational efficiency and resource utilization within healthcare settings (J. K. Dash, personal communication, May 28, 2023). As AI continues to evolve, its integration promises further enhancements in efficiency and resource utilization, reshaping traditional practices and optimizing operational processes in radiology facilities and beyond. Metal detectors replace a human body checker, eliminating the need for their expertise in this field. They do not operate in any other locations where this technology is implemented, effectively rendering the profession obsolete.

Similarly, smartphones have supplanted traditional telephones, rendering telephone receivers obsolete. The radiology department no longer uses telephones; instead, it uses official cellphones, email, and WhatsApp contact information. Computers have displaced ledger and file management personnel, as well as traditional accountants. MRI machines, capable of running different quality scans simultaneously, replace multiple machine operators at once, along with displacing traditional and personal knowledge in radiology. Advanced CT scan machines require fewer helpers to maintain patient conditions, further displacing human intervention. Cath labs streamline surgical processes by handling 6–8 tools at once, reducing the need for 3–4 personnel. Portable ultrasound and X-ray machines eliminate the need for wheelchair assistance in transporting patients.

The pervasive influence of AI and digital technology on healthcare at KMC Hospital, particularly in radiology, is leading to the displacement of various roles within the field. As AI systems like the Performance and Talent (PAT) platform streamline

processes, offering remote access to medical services and digital reports, traditional roles such as dispatchers and cleaners are rendered obsolete. Additionally, the integration of digital platforms in radiology facilities eliminates the need for traditional communication tools like telephones, further displacing related professions.

Moreover, advanced imaging technologies like MRI and CT scan machines reduce the requirement for human intervention, displacing multiple roles involved in operating and maintaining such equipment. The transformative impact of AI extends beyond operational processes, reshaping traditional practices and optimizing resource utilization within radiology facilities and healthcare settings at large. This shift underscores the necessity for healthcare professionals to adapt to technological innovations and acquire expertise in AI integration to remain relevant in the evolving healthcare view.

The AI technology in healthcare at KMC Hospital, particularly within radiology, signifies a monumental shift in operational practices and employment dynamics. While offering unparalleled convenience and efficiency in patient care, AI systems are reshaping traditional roles and functions within healthcare facilities. Radiologists are increasingly required to adapt to and master AI systems, leading to a decline in the overall number of radiologists while emphasizing the need for specialized individuals proficient in AI integration.

Moreover, AI technology is directly displacing certain roles within radiology, such as dispatchers and cleaners, as compact and efficient AI systems minimize space requirements and streamline operational processes. Beyond radiology, the broader healthcare view witnesses similar transformations, with technological advancements rendering traditional roles and practices obsolete. From metal detectors replacing human body checkers to smartphones supplanting traditional telephones and portable ultrasound and X-ray machines eliminating the need for wheelchair assistance, the integration of AI and advanced technology continues to redefine the relationship between technology and employment within healthcare settings.

5.5 Use of AI and Creation, Replacement and Displacement of Employment in Administration

Due to AI, the administrative work environment is undergoing a significant transformation as repetitive tasks like scheduling and resource allocation become

automated (Kolbjørnsrud et al., 2016). This automation liberates human capacity for strategic pursuits like decision-making and problem-solving, acknowledging the irreplaceable role of human judgment, creativity, and social skills in managerial contributions.

However, a comprehensive perspective must account for both the benefits and challenges of AI integration (Alshadoodee, 2022). While automation may lead to job displacement, it also creates novel opportunities in areas such as system development and maintenance, necessitating investment in employee upskilling (Henman, 2020). Ethical considerations regarding bias and transparency in AI decisions are paramount, particularly in public administration, requiring responsible implementation and adherence to ethical standards (Henman, 2020). Despite concerns about job displacement, AI's role in service industries offers innovative solutions, prompting the exploration of collaborative approaches between humans and machines (Huang & Rust, 2018). Proactive government regulation is essential to navigate the impact of AI on public administration (Reis et al., 2021), while addressing employee perceptions of automation technologies is crucial for preparing for the evolving job market (Brougham & Haar, 2018). Also, the progress of AI and robotics is changing traditional economic models.

This is putting workers out of work and highlighting the need for research and policy interventions, such as retraining programs and limits on too much automation (Acemoglu & Restrepo, 2018; Chen et al., 2022). Investment in reskilling and upskilling programs is essential to prepare individuals for the AI economy, alongside initiatives like (UBI) (Bruun & Duka, 2018). Ongoing dialogue and adaptation are imperative as AI technology evolves, ensuring a future where both humans and AI thrive while mitigating job displacement and maintaining competitiveness in the job market.

Established in 1996, the hospital initially operated with 80 staff members, a number deemed excessive for its limited services. Over time, the hospital's offerings expanded, necessitating additional personnel to meet growing demands. As services and facilities steadily increased, the institution embarked on structural and faculty expansions, further augmenting its workforce. The evolving view of healthcare mandates the recruitment of new staff to fulfill the expanding array of tasks. Consequently, the hospital's initial surplus of personnel became integral to its ability to

adapt and thrive in an ever-changing healthcare environment. With a commitment to enhancing patient care and advancing medical capabilities, the institution's growth trajectory mirrored its dedication to excellence.

Through strategic expansion and recruitment initiatives, the hospital optimized its operational capacity and reinforced its position as a cornerstone of healthcare within the community. P. P. Thapa, reported that the hospital employs a total of 616 staff members dedicated to hospital administration, including those serving in colleges and hospitals. The staff composition encompasses both educated and uneducated individuals, collectively capable of managing all hospital operations effectively (personal communication, May 9, 2023). The hospital relies on this diverse workforce as its operational backbone, entrusted with executing a wide range of activities essential for its functioning.

According to Thapa, the collective efforts, the staff ensure the seamless operation of eight hospital departments, contributing to the delivery of quality healthcare services. With each staff member playing a crucial role in the hospital's operations, their collective expertise and dedication form the foundation upon which the institution thrives. (personal communication, May 9, 2023). The staff utilizes various technological tools, such as billing machines, laptops, desktops, attendant machines, and calculators, in their daily administrative routines. Among these tools, laptops and desktops are classified as expert AI, while billing machines, attendant machines, and calculators fall under the category of rule-based AI.

These instruments streamline administrative processes, making tasks more manageable and efficient. With the aid of AI, completing assignments becomes a straightforward endeavor, contributing to timely task execution. The integration of AI technologies expedites operations, enabling staff members to accomplish their duties within designated time frames.

This seamless incorporation of AI into daily administrative functions underscores its significance in enhancing productivity and optimizing workflow efficiency (N. Dahal, personal communication, July 10, 2023). As a result, staff members can leverage these AI tools to navigate through their responsibilities with increased accuracy and effectiveness, ultimately fostering a more streamlined and proficient work environment. In certain sectors, the presence of AI tools for task

completion is limited, necessitating a larger workforce compared to other industries. This imbalance is attributed to the scarcity of AI tools and the consequent reliance on human labor.

In contrast, there exists an inverse correlation between the prevalence of machines and the extent of human labor involvement. Machines often outperform humans in task execution, leading to a scenario where fewer machines can accomplish more work compared to a greater number of human workers. This dichotomy highlights the inverse relationship between machine utilization and human labor engagement. While AI tools streamline certain processes, their limited availability necessitates a higher dependency on human resources to fulfill organizational objectives.

As a result, industries with fewer AI tools often require a larger workforce to maintain operational efficiency, underscoring the intricate balance between technological advancement and human capital within contemporary work environments. As per technician S. Ojha's assessment, the administration possesses a total of 80 laptop and desktop computers, each manned by a skilled individual. Additionally, there are five billing machines available, with two counters dedicated to their use (personal communication, May 20, 2023). Among these machines, three are designated as stock machines, reserved for emergency situations.

Furthermore, the administration boasts eleven attendant machines, responsible for catering to the needs of all hospital staff members. The presence of these technological assets underscores the administration's commitment to operational efficiency and service delivery. Each computer and machine play a crucial role in facilitating administrative tasks and ensuring seamless operations within the hospital. With dedicated personnel and specialized equipment at their disposal, the administration is equipped to navigate various challenges and address the diverse needs of its staff and patients alike. Staff members utilize computers to conduct audits on hospital billing. The billing process primarily revolves around human interaction and dialogue. Engaging in social interactions poses a challenge for AI machines, as they excel at performing physical tasks but lack the capacity for emotional engagement.

Consequently, computers remain disconnected from the realm of human-machine interactions. While adept at executing various functions, computers do not bridge the gap between humans and machines in terms of emotional connection and

interpersonal communication. The intricacies of social relations, which require empathy and understanding, lie beyond the capabilities of AI machines. According to engineer R. Mahato, despite their utility in streamlining processes and enhancing efficiency, computers do not facilitate meaningful exchanges or emotional connections between individuals and machines (personal communication, May 18, 2023). As such, the domain of human relations remains firmly rooted in human-to-human interactions, where empathy, understanding, and emotional intelligence play pivotal roles in fostering meaningful connections and relationships.

In contemporary administrative environments, the proliferation of AI technologies has significantly impacted job creation dynamics. Unlike other sectors where AI's dominance might render human labor obsolete, administrative roles thrive due to the inherent limitations of AI in social and relational tasks. The complexity of human interactions necessitates a higher demand for human workers within administrative settings, fostering a rich view of job opportunities. While AI excels at executing physical tasks, its incapacity for emotional engagement and nuanced social interactions creates a niche for human professionals.

For instance, attendant machines necessitate attendant machine maintainers for upkeep and accuracy checks, while computer operators manage calculations and operational tasks, resulting in increased job opportunities. Even as AI tools streamline administrative processes, they cannot replace the indispensable role of human-to-human interactions in fostering meaningful connections and relationships within the administrative sphere. Thus, the coexistence of AI and human labor in administrative roles underscores the intricate balance between technological advancement and the enduring importance of human expertise and empathy in contemporary workplaces.

The integration of AI into administrative tasks has transformed the nature of work dynamics, gradually replacing traditional roles and reshaping workforce compositions. Historically, AI machines are now effective at managing tasks that were once reserved for human labor. Computer technicians, previously tasked with data input, now find their roles streamlined as computers automate these processes, replacing ledger systems and reducing the need for manual labor. With five ledger workers substituted by a single computer technician, the hospital administration optimizes its operational efficiency.

Similarly, the advent of attendant machines and calculators further streamlines administrative functions, reducing the need for manual intervention. However, while AI excels in physical tasks, its limitations become evident in social and relational domains where human engagement is paramount. The complexity of human-to-human interactions necessitates a workforce capable of empathy and understanding, aspects beyond the realm of AI. As a result, there are still plenty of openings in administrative positions due to the demand for tasks that are human-centric. The evolving view demands a nuanced approach where AI complements human efforts, enhancing productivity while preserving the essence of interpersonal connections within administrative frameworks. As AI continues to evolve, its integration underscores the delicate balance between technological innovation and human capital, ensuring a harmonious symbiosis within administrative environments.

The integration of AI into administrative tasks has led to a significant displacement of human jobs within the hospital's operations. Initially, the reliance on manual labor was prominent, with multiple staff members engaged in tasks such as auditing, billing, and data entry. However, the introduction of AI systems has revolutionized these processes, rendering many traditional roles obsolete. For instance, where four auditors were once required, now a single computer auditor suffices, and the smart billing system has displaced four billers from their counters.

Additionally, seven additional attendant machines have taken the place of one, streamlining staff attendance management. The advent of AI has also impacted roles like data entry, with computer operators replacing the need for calculator users and ledger workers. Engineer Rachha Mahato highlights that without computer accounting systems, the need for manual accountants would soar, displacing several existing positions. While AI enhances efficiency in physical tasks, it falls short in social and relational aspects, creating a demand for human-to-human interactions in administrative roles. Despite the efficiencies AI brings, the job view within administration undergoes a fundamental shift, emphasizing the need for reskilling and adaptation to a technology-driven environment.

The integration of AI into administrative tasks has revolutionized the workforce dynamics within the hospital's operations, leading to both displacement and the creation of human jobs. Initially, the hospital relied heavily on manual labor, with numerous staff members engaged in tasks like auditing, billing, and data entry. However, the

introduction of AI systems has transformed these processes, rendering many traditional roles obsolete while creating new opportunities.

For instance, where multiple auditors were once required, now a single computer auditor suffices, and smart billing systems have replaced several billers from their counters. Additionally, attendant machines have streamlined staff attendance management, and computer operators have replaced the need for calculator users and ledger workers. Engineer Rachha Mahato emphasizes that while AI enhances efficiency in physical tasks, it lacks in social and relational aspects, creating a demand for human-to-human interactions in administrative roles. Despite the efficiencies AI brings, the job view within administration undergoes a fundamental shift, highlighting the need for reskilling and adaptation to a technology-driven environment. This evolution underscores the delicate balance between technological innovation and human capital, ensuring a harmonious symbiosis within administrative environments while emphasizing the importance of human expertise and empathy in contemporary workplaces.

In conclusion, the integration of AI into administrative tasks within the hospital's operations has brought about a significant transformation in job creation, replacement, and displacement dynamics. Initially established with 80 staff members, the hospital's expansion necessitated structural and faculty growth, resulting in a workforce of 616 dedicated to hospital administration. While AI tools like laptops, desktops, billing machines, and attendant machines streamline administrative processes and enhance productivity, they also pose challenges in social and relational tasks due to their inability to engage emotionally.

Consequently, human-to-human interactions remain pivotal in administrative settings, creating a niche for human professionals despite AI's advancements. The evolving view underscores the delicate balance between technological innovation and human expertise, requiring a nuanced approach to ensure harmony between AI efficiencies and the enduring importance of human connections in contemporary workplaces. As AI continues to evolve, its integration reshapes workforce composition, emphasizing the need for reskilling and adaptation to a technology-driven environment within administrative frameworks.

5.6 Use of AI and Creation, Replacement and Displacement of Employment in Security

The future of security work evolves with the integration of AI and technological advancements across various domains such as AI development, programming, data science, analytics, and cybersecurity, with a keen focus on ethics and policy considerations (Osoba & Welser, 2017). In an era of digital interconnectedness, security professionals must continuously hone their skills to address the complex challenges posed by evolving threats (Huang et al., 2016). With the surge in international travel exacerbating shortages in immigration officers, particularly affecting border operations and immigration service management, there is a pressing need for innovative solutions (Huang et al., 2016). Employing simulation and heuristic algorithms, as highlighted by Parka et al., (2006), becomes imperative in optimizing the allocation of airport immigration officers to bolster border security management.

Dynamic analyses of workforce supply and demand, especially in sectors like information security, are essential for forecasting and addressing imbalances (Parka et al., 2006). Emphasizing the mechanical trade skills essential for job security, as Paulinus and Ojadi (2021) investigated in Nigeria, and addressing skilled labor shortages through vocational education reforms, as Ozernikova and Kuznetsova (2017) discussed in Russia, become crucial imperatives.

Additionally, Veas (2019) examined the evolution of commercial security in Slovakia, underscoring the significance of matching industry demands with security management education. However, as Petropoulos (2018) noted, the rapid advancement of AI threatens to cause widespread job displacement in the security sector as surveillance technologies with AI capabilities gradually replace human security personnel (Borah et al., 2019). The looming crisis of AI job displacement necessitates proactive measures to prepare and protect the affected workforce, emphasizing the urgency for adaptation and resilience in the face of accelerating technological change.

Established in 1996, the security unit at KMC Hospital initially operated as a small functional entity, witnessing the emergence of services and patient flow within its premises. Over time, the unit expanded steadily to meet the growing demands of the hospital, with its primary objective remaining focused on enhancing patient flow. Despite the absence of a dedicated security force initially, the hospital administration's

proactive approach of appointing security personnel ensured the smooth functioning of the unit, playing a pivotal role in maintaining order and facilitating patient movement since its inception.

Society's diverse security needs prompted the engagement of different security groups by the KMC group to maintain order, with the Garud and Universe security force groups assuming responsibility for overseeing the security command system and ensuring overall security within their jurisdiction (L. Lamichhane, personal communication, July 11, 2023). Through their effective management of security operations, these groups play a crucial role in upholding safety standards and safeguarding the interests of the community, contributing significantly to maintaining a secure environment conducive to the well-being and functioning of society.

The combined strength of 22 security personnel from Garud and an additional 22 individuals from the Universe security force proves adequate for managing security operations effectively. Equipped with essential tools such as radio sets, metal detectors, phones, CC cameras, computers, and electronic attendant machines (see Section 4.6 Table. 9), these personnel navigate their duties smoothly, with radio sets, metal detectors, and phone sets serving as indispensable tools in their daily routines, facilitating efficient communication and surveillance. The administration exercises oversight by monitoring the situation through CC camera monitors, allowing for timely intervention and coordination with the security force as needed (L. Lamichhane, personal communication, July 11, 2023). Through the strategic utilization of technology and vigilant monitoring, the security personnel uphold safety standards and ensure the smooth functioning of security protocols in their designated areas of responsibility.

According to L Lamichhane, the chief of the Garud force, prior to the installation of CC cameras, the security team comprised 56 personnel tasked with security management (personal communication, July 11, 2023). However, with the implementation of CC cameras, 34 security personnel were deemed redundant and subsequently removed from duty. Despite the expanding service area, the adoption of AI technology has led to a reduction in the number of required security measures. The introduction of CC cameras has optimized security operations, allowing for enhanced surveillance and monitoring capabilities without solely relying on manpower.

As a result, the integration of AI solutions has enabled the security force to streamline its resources while maintaining effective security protocols, thus adapting to the evolving demands of security management in an increasingly technologically advanced view. Security in hospitals encompasses the surveillance and protection of various buildings, all managed through the utilization of CC cameras (S. Ojha, personal communication, May 20, 2023). Additionally, the integration of radio sets and smartphones further enhances security measures, allowing for efficient communication and coordination among personnel, with the scale of communication necessitating the use of these tools, which are integral to managing the implementation of smart security systems effectively. The presence of a strong security force and the combined efforts of devoted staff members guarantee the provision of high-quality service. According to Lila Lamichhane,

Through the strategic deployment of technology and effective communication channels, hospitals can maintain a safe and secure environment for patients, staff, and visitors alike, with the seamless integration of these tools underscoring the commitment to upholding stringent security protocols while adapting to the evolving view of security management in healthcare facilities. The security force is relieved from duty in various locations, such as the storeroom, building passages, hostels, colleges, and public areas, where surveillance is now conducted using CC cameras (L. Lamichhane, personal communication, July 11, 2023).

These cameras are also installed in classrooms and offices to bolster security measures throughout the premises, with the widespread deployment of CC cameras proving instrumental in ensuring the success of security management initiatives. Attests to the significant presence of 150 CC cameras strategically installed across the hospital grounds for the purpose of enhancing security measures, with continuous monitoring and surveillance strengthening the overall security infrastructure, effectively deterring potential threats, and safeguarding the well-being of individuals within the hospital environment. Six sets of radios enable communication among team members, ensuring quick and efficient coordination. Gatekeepers use two metal detectors on the security team to identify potential threats.

Additionally, for security management purposes, the team possesses two Khukuri knives and six sticks, with a single computer employed to streamline daily activities and maintain attendance records, managed entirely by the security personnel

without the need for technical or expert assistance (L. Gurung, personal communication, July 12, 2023). Even though they do not have any specialized help, the security group expertly oversees computer operations, making the most of the resources they have to ensure safety and efficiency in their work. The strategic use of equipment and resourceful management practices make sure that they are always alert and ready to deal with security problems within their operational scope.

The advent of AI tools has catalyzed the creation of new job roles and expanded the horizons of security work across various sectors. Roles such as the CC camera monitor observer have emerged to harness the capabilities of AI tools, while opportunities in hospital security, particularly with metal detectors, have flourished to enhance operational efficiency. Since its inception in 1996, KMC Hospital's security unit has undergone a transformative journey, evolving from a basic functional entity into a comprehensive system aimed at optimizing patient flow within its premises. Initially, the absence of a dedicated security force prompted the hospital's proactive stance in appointing security personnel to manage operations, ensuring smooth functioning despite the lack of formal protocols.

Over time, the integration of diverse AI tools, spanning expert AI like computers and smartphones, alongside rule-based AI such as CC cameras, radio sets, and metal detectors (see Section 4.6 table 9), has revolutionized security procedures within the hospital. Collaborations with security groups like Garud and Universe have bolstered the overall safety apparatus, fostering a secure environment conducive to societal well-being. With the deployment of personnel equipped with essential tools and Chief L. Lamichhane's insights into the optimization of security operations through AI integration, KMC Hospital remains at the forefront of security management, leveraging technology to deter threats and safeguard individuals' welfare (personal communication, July 11, 2023). Despite challenges, the adept management of daily activities underscores the commitment to safety and efficiency, highlighting the seamless integration of AI solutions in maintaining stringent security protocols among technological advancements.

AI technology has transformed the view of security operations, necessitating skilled workers in the sector. At KMC Hospital, AI replaces unskilled security personnel, particularly with tools like metal detectors and radios, where knowledgeable workers are essential for optimal performance. Basic computer literacy is imperative

for completing security courses, and KMC Hospital emphasizes the training of security personnel in utilizing AI tools effectively. KMC Hospital's security unit has evolved into a sophisticated system aimed at optimizing patient flow within the premises. Initially reliant on human personnel, the integration of AI tools such as CC cameras, radio sets, metal detectors, smartphones, and computers (see Section 4.6 table 9) have revolutionized security procedures.

Through collaboration with security groups like Garud and Universe, AI technology efficiently coordinates security measures, reducing the dependency on human personnel. L. Lamichhane's acknowledgment of redundant security personnel post-CC camera installation underscores the optimization of security operations through AI integration (personal communication, July 11, 2023). As AI solutions streamline resources and enhance surveillance capabilities, security teams adapt to evolving demands, reinforcing security infrastructure and ensuring individuals' well-being within the hospital environment. The strategic deployment of AI tools minimizes reliance on manpower while upholding stringent security protocols, marking a paradigm shift in security management within healthcare facilities.

AI technology, which is continually advancing, directly displaces security jobs. At KMC Hospital, the installation of CC cameras led to the removal of 34 security personnel out of the initial 56, clearly demonstrating how AI replaces human labor. Unskilled security personnel find themselves sidelined by AI tools. The security unit at KMC Hospital started as a modest entity, expanding gradually to meet rising demands and ensure patient flow. Initially, lacking a dedicated force, security personnel managed the unit, which was crucial for maintaining order and patient movement.

However, the integration of AI tools such as CC cameras, radios, metal detectors, smartphones, and computers have revolutionized security procedures, reducing reliance on human resources. Garud and Universe security force groups contribute significantly to maintaining a secure environment, but AI technology optimizes operations, streamlining resources while adapting to technological advancements. Surveillance, managed through CC cameras, radios, and smartphones, diminishes the need for human intervention. Despite challenges, the security team adapts, leveraging available resources to uphold safety and efficiency. Through AI solutions, security measures remain vigilant, marking a paradigm shift in security management within healthcare facilities.

The integration of AI technology in security operations at KMC Hospital has led to a complex interplay of the creation, replacement, and displacement of security jobs, resulting in both harmony and conflict within society. Initially, AI tools have created new job roles, such as the CC camera monitor observer, expanding the scope of security work and enhancing operational efficiency, particularly in hospital security with tools like metal detectors.

However, the introduction of AI has also directly displaced traditional security jobs, as seen with the removal of 34 security personnel following the installation of CC cameras, highlighting the diminishing reliance on human labor. While skilled workers are essential for optimal performance with AI tools, unskilled security personnel may find themselves marginalized in the evolving security view. Despite these challenges, the integration of AI solutions has streamlined security operations, enabling hospitals at KMC to adapt to technological advancements and uphold stringent security protocols. Security underscores the need for society to navigate the delicate balance between technological progress, workforce transformation, and the preservation of human welfare within healthcare facilities.

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This shift poses challenges for unskilled security personnel, who may face marginalization in an evolving security view increasingly reliant on AI solutions. Yet, despite these conflicts, the integration of AI-powered tools has streamlined security protocols, empowering institutions at KMC Hospital to navigate technological advancements while upholding stringent safety standards. This paradigm shifts toward AI security underscores the imperative for society to navigate the intricate interplay between technological innovation, workforce adaptation, and the preservation of human welfare within healthcare environments at KMC Hospital.

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5.7 Use of AI and Creation, Replacement, and Displacement of Employment in Housekeeping

AI technology revolutionizes housekeeping dynamics, fostering improved communication and offering novel opportunities within group dynamics (Kennedy et al., 2015). This transformative technology reshapes expertise distribution, crucial for executing 'digital housekeeping' tasks essential for maintaining a networked home, evaluating labor allocation, digital proficiency, and the gendered distribution of household responsibilities (Kennedy et al., 2015).

Feibert and Jacobsen's (2019) findings underscore technology's critical role in overseeing hospital services and enhancing healthcare logistics, necessitating a skilled workforce proficient in managing intricate systems (Feibert & Jacobsen, 2019). Similarly, as service robots become integral to healthcare delivery among the COVID-19 pandemic, careful consideration of acceptance and safety is paramount (Holland et al., 2021). Automation in housekeeping aligns with Autor and Dorn's (2013) research,

reflecting shifting consumer preferences and the declining cost of automating routine tasks (Autor & Dorn, 2013).

Whiting and Symon (2020) highlight the reduction in housekeeping personnel due to digital technology's streamlining effect on tasks, leading to the emergence of 'digi-housekeeping' (Whiting & Symon, 2020). Sociocultural processes perpetuate the invisibility of digi-housekeeping, intensifying feelings of work pressure (Whiting & Symon, 2020). Furthermore, changes in household management techniques influenced by industrial capitalism and professionalization intersect with gender ideals within a complex class system, reflecting shifts in perceptions of domestic labor (Lieffers, 2012). Thus, AI technology reshapes traditional roles, offering efficiency gains while necessitating adaptation to evolving labor dynamics and societal perceptions.

The housekeeping department at KMC Hospital, which opened in 1996, has undergone a remarkable evolution thanks to the strategic integration of technology. Initially, with a smaller patient base, the workload was manageable. However, R. Makaju, a department member, emphasizes the transformational impact of machinery on daily operations. These machines not only expedite tasks but also elevate overall quality (personal communication, August 5, 2023). Reduced time consumption and streamlined processes are hallmarks of this technological revolution. The security department of KMC service delivery has demonstrably improved, allowing it to adapt to ever-growing demands and deliver superior outcomes. As technology continues its relentless march forward, it remains an indispensable tool in optimizing the department's efficacy and ensuring it remains well-equipped to serve the community. The department's success hinges on a workforce of 207 individuals who meticulously manage daily operations.

Leveraging a combination of rule-based and expert AI tools, they achieve exceptional productivity. Their arsenal includes 4 washing machines, 2 hydro extractors, 4 drying machines, 5 autoclaves, 2 floor cleaning machines, a grass cutter, and a computer (see Section 4.7 table 10). These resources operate tirelessly across three daily shifts to ensure seamless task fulfillment. To cater to varying levels of technological literacy, a hybrid attendance system is employed, combining digital and ledger methods. This inclusive approach ensures accuracy while accommodating those less familiar with digital tools. This strategy underscores the department's commitment to both efficiency and inclusivity. By embracing technology and fostering diverse

attendance mechanisms, the housekeeping department maintains a smooth workflow, flawlessly meeting operational demands while supporting the needs of its diverse workforce (S. Poudel, personal communication, August 6, 2023). Such adaptability proves vital for sustaining productivity and fostering a positive work environment.

The most significant impact of technology lies in the department's machinery. A team of 24 people previously completed laundry tasks. However, with the introduction of four washing machines, two hydro extractors, and four drying machines, the workforce required has been halved across three shifts (two individuals per shift). This translates to a remarkable reduction in completion time, with tasks that once took 4-5 hours now achievable in just 2 hours.

Beyond efficiency gains, these machines utilize fewer chemicals, minimizing costs and environmental impact. This aligns perfectly with the department's commitment to cost-effectiveness and environmental responsibility. The grinder machine plays a pivotal role in handling external contracts, particularly exile-related tasks. Traditionally, flower cleaning within the hospital premises was a labor-intensive process, requiring six individuals. However, even before the contract exile system's implementation, a single person could outperform the collective effort of six workers. The grinder machine further revolutionized this process.

According to R. Makhaju, it not only streamlines the task but also enhances quality and effectiveness. Mechanization ensures consistent quality, surpassing what manual labor can achieve (personal communication, August 5, 2023). Moreover, by optimizing resource allocation and ensuring timely task completion, the grinder machine exemplifies the department's commitment to modernizing administrative processes and bolstering overall hospital efficiency.

This allows the administration to confidently handle external contracts while upholding impeccable service standards. Computers act as a workhorse for managing daily activities and staff attendance. These computerized systems smoothly record routine evaluations for future reference. Compared to traditional ledger systems, computers offer a significant advantage by streamlining tasks and accelerating processes, leading to enhanced overall efficiency. Beyond record-keeping, grass-cutting machines have revolutionized outdoor maintenance. A single machine can complete the task in an hour, which is equivalent to the work of ten individuals.

This exemplifies the organization's dedication to modernization and operational optimization through technology. As R. Makaju emphasizes, technology not only improves workflow efficiency and expedites tasks in a cost-effective manner, but it also elevates the overall service quality, contributing to a more streamlined and effective work environment (personal communication, August 5, 2023). Finally, the autoclave machines play a critical role in maintaining infection prevention within the hospital setting. Both infected and regular dust types pose a threat in hospital environments. CSSB utilizes three autoclaves to meticulously sanitize the instruments used by doctors and nurses, ensuring they remain free of infectious agents.

R. Makaju said that regular disinfection processes are paramount to maintaining the cleanliness and sterility of these machines (personal communication, August 5, 2023). Through a rigorous disinfection regimen, CSSB ensures that the autoclave machines remain infection-free, thereby upholding the highest standards of hygiene in the medical environment. In conclusion, KMC Hospital's housekeeping department serves as a compelling testament to the transformative power of technology. With the help of administration, the department has achieved remarkable progress in efficiency, quality, and environmental Intelligence. This commitment to continuous improvement ensures the department remains well-equipped to serve the community and uphold the highest standards of patient care.

KMC Hospital's housekeeping department, housing 207 dedicated employees, utilizes a blend of rule-based and advanced expert AI to maintain daily cleanliness efficiently. While the integration of new technologies demands skilled manpower, the hospital optimizes its current workforce to smoothly adopt the latest tools. However, as the institution embraces cutting-edge technology, it necessitates additional manpower to sustain daily operations, prompting active recruitment and fostering community job opportunities. As R. Makaju emphasizes, this strategic approach not only improves hospital efficiency but also stimulates economic growth by creating jobs (personal communication, August 5, 2023). As KMC Hospital evolves, its commitment to ensuring a clean, safe environment for patients, staff, and visitors remains unwavering, concurrently fostering job creation and development.

Similarly, Ramdas Society's installation of 4 cloth drying machines and 5 autoclaves not only boosts efficiency but also generates employment prospects within the community. Despite the reliance on machinery, human labor remains essential for

optimal technological operation. At KMC Hospital, the collaborative synergy between human workers and AI tools is imperative for day-to-day functions, with skilled labor pivotal in effectively operating advanced systems. Consequently, the hospital frequently generates new job opportunities to meet the demand for skilled workers, thereby bolstering employment growth. Through the integration of innovative solutions and the acknowledgment of human input's significance, both Ramdas Society and KMC Hospital play integral roles in job creation and economic advancement within their respective communities.

In the housekeeping sector, the integration of AI manifests in two forms: rule-based and skilled labor-driven systems. The prevalence of rule-based AI prompts a transition where skilled workers supplant their unskilled counterparts. Consequently, while the overall workforce expands, the need for skilled labor increases, offsetting the requirement for a smaller number of workers. Similarly, the washing sector exemplifies this trend, as 8 workers were initially employed, but now only 2 suffice, with a total of 24 workers replacing the previous 6 in clothing production.

This paradigm shift underscores the transformative impact of AI on workforce dynamics, significantly altering traditional labor patterns. Furthermore, the evolution of AI technology extends to other sectors like grass-cutting, where a single machine now accomplishes the workload of 10 individuals. This paradigm shift emphasizes the efficiency gains made possible by automation, as one machine can effectively replace ten workers or, alternatively, ten people can replace the productivity of a skilled worker. Thus, the evolving view of AI tools continues to redefine labor structures, presenting both opportunities and challenges for industries adapting to technological advancements.

As technology advances, the displacement of skilled housekeeping workers by automated systems becomes increasingly apparent, rendering their roles redundant in various industries. In the washing sector, where 24 workers are employed across shifts, the integration of rule-based AI technology eliminates the need for 18 workers, demonstrating the efficiency gains achieved through automation. Furthermore, the deployment of floor washing machines consolidates the workload, with one machine effectively replacing the tasks of 6 individuals. Consequently, skilled floor washers find themselves replacing the displaced workers, further contributing to the reduction of the overall housekeeping workforce.

This trend reflects a broader shift towards automation and technology-driven solutions in the housekeeping sector. The KMC hospital has machines that outperform humans in efficiency and precision. While these advancements enhance operational efficiency, they also result in job displacement for skilled workers, highlighting the challenges faced by the workforce in adapting to technological innovations in housekeeping and other industries.

The narrative of KMC Hospital's housekeeping department embodies both conflict and harmony in the development of AI technology. Initially, technology's integration disrupted traditional labor patterns, displacing skilled workers with rule-based AI systems. While efficient, this shift posed challenges to workforce dynamics as skilled labor became increasingly vital. Similarly, in the washing sector, automation reduced the need for workers, symbolizing the clash between human labor and technology. However, among displacement, technology also fostered harmony by enhancing efficiency and quality.

The housekeeping department's strategic use of AI optimized operations, stimulating economic growth and job creation within the community. Despite technological advancements, human collaboration remained crucial, ensuring seamless integration and operation of AI tools. The narrative underscores the transformative power of technology, reshaping labor structures while emphasizing the necessity of human input. Ultimately, KMC Hospital exemplifies the delicate balance between conflict and harmony in the evolution of AI technology, where innovation drives progress while fostering inclusivity and efficiency in the workforce.

In conclusion, the integration of technology in KMC Hospital's housekeeping department has brought about significant transformations, enhancing efficiency, quality, and environmental responsibility. With a workforce of 207 individuals and a combination of rule-based and advanced AI tools, the department has optimized its operations while creating job opportunities within the community. Despite the fact that AI helps with automation in the housekeeping department and has led to the displacement of skilled and unskilled workers, it presents challenges in workforce dynamics that create new social debate.

However, the new technology has the potential to maintain sanitization so that the hospital's commitment to ensuring a clean and safe environment for patients, staff,

and visitors remains unwavering. Similarly, the evolution of AI tools in housekeeping sectors like washing and grass-cutting has reshaped labor structures with the development of AI, highlighting the ongoing conflict between job displacement and technological advancement.

Nevertheless, by embracing technology and fostering collaboration between humans and AI, institutions like KMC Hospital pave the way for economic growth, job creation, and sustainable development within their respective communities. Thus, while technology continues to redefine labor patterns, the harmonious integration of human expertise and technological innovation remains essential for fostering inclusive and efficient work environments in the face of evolving technological views.

5.8 Use of AI and Creation, Replacement and Displacement of Employment in Driving

While the study looks at how self-driving car technologies could change the way we travel, it also finds that these technologies could create new jobs in the transportation industry (Chandavarkar & Nethravathi, 2023) by making transportation easier to use and cheaper, which would help low-income families and people who have trouble moving around. This technology prompts a comprehensive review of its implications, encompassing security, economic viability, and workforce dynamics, advocating for a gradual introduction approach (Chandavarkar & Nethravathi, 2023). The integration of cameras within vehicles not only fosters growth within the driving sector, particularly in tasks related to camera operation and display management, but also introduces innovative driver monitoring algorithms designed to enhance road safety (Mašanović et al., 2019).

As self-driving vehicles rely on advanced autonomous driving systems powered by AI, the need for skilled drivers to interact with these systems becomes paramount, necessitating comprehensive training programs to equip both existing and new drivers with the requisite competencies (Tampuu et al., 2023). Meanwhile, efforts to address workforce displacement due to automation are underway, with research focusing on identifying optimal transition occupations for workers facing displacement and evaluating the attractiveness of these alternatives based on various factors (Van Fossen et al., 2023; Wang et al., 2023). Despite the technical and societal complexities associated with autonomous driving, ongoing advancements aim to enhance road safety

and efficiency, highlighting the critical role of AI and robotics in shaping the future of transportation (Cui et al., 2019). The development of technology will totally change the nature of the profession.

KMC Hospital leverages a fleet of five contract-based vehicles, including three ambulances and two staff buses, to support its operations. These contemporary vehicles, equipped with technology unimaginable in the hospital's early days, reflect the institution's dedication to innovation and efficiency. Their effective operation necessitates drivers to possess specialized knowledge and utilize AI-based tools, which significantly augment their capabilities and streamline daily tasks, ultimately enhancing service delivery.

This seamless integration of technology and AI solutions exemplifies KMC Hospital's commitment to leveraging advancements for optimized patient care and staff management, aligning with contemporary trends in healthcare administration and service provision. Om A. Magar, an ambulance driver at KMC Hospital, sheds light on the classification system for ambulances in Nepal, where his Magar Drive ambulance runs the second-class category (personal communication, September 2, 2023). This ambulance is equipped with essential medical instruments, including a patient monitor machine, an oximeter (introduced in 2021), and an oxygen cylinder, thermometer, and oxygen meter (present since 2000) (see Section 4.8 table 11). These instruments play a crucial role in assessing patient condition during transport.

The patient monitor and oximeter provide real-time data on vital signs and oxygen levels, empowering Magar to make informed decisions about the most appropriate destination for the patient. If the monitor detects a critical condition, Magar prioritizes transporting the patient to the nearest hospital for immediate medical attention. Otherwise, the patient is transported to KMC Hospital. Notably, the patient monitor and oximeter are designed for user-friendliness, allowing Magar to utilize them effectively without requiring specialized expertise. Magar's familiarity with the oxygenation process further enhances his ability to make informed decisions based on the patient's condition. The oxygen machine accurately measures and displays the patient's oxygen levels, aiding in determining the most suitable medical facility for the patient's needs.

This technology not only facilitates prompt medical intervention for critical or respiratory patients but also ensures efficient and effective transport to the appropriate medical facility, thereby optimizing patient care during emergency situations. Through the integration of these medical tools and Magar's expertise, the ambulances are equipped to provide lifesaving services to patients in need, demonstrating a commitment to delivering high-quality emergency medical care in Nepal. O. A. Magar, further emphasizes the modern features of ambulances, which include a driver display system providing essential information such as running kilometers, fuel levels, engine status, and indicators for various vehicle functions (personal communication, September 2, 2023). This technological setup extends beyond ambulances, as staff buses are also equipped with this system, enhancing operational efficiency and safety.

The driver displays acts as a comprehensive dashboard, allowing drivers to monitor vehicle performance in real-time, ensuring optimal functionality and reliability during transportation operations. The inclusion of these features contributes to maintaining the vehicles' condition and performance, thereby facilitating the smooth execution of daily tasks. Furthermore, O. A. Magar, highlights the significance of these advancements as rule-based AI tools that streamline driving tasks and enhance the overall driving experience (personal communication, September 2, 2023). These AI tool's function based on predefined rules and algorithms, effectively interpreting data from various sensors and systems within the vehicle to provide relevant information to the driver. By leveraging these rule-based AI tools, drivers can make informed decisions, optimize driving behavior, and ensure the safety and efficiency of their journeys.

Overall, the integration of modern technological features in ambulances and staff buses underscores a commitment to improving driving life by enhancing vehicle monitoring, performance, and operational capabilities through the utilization of rule-based AI tools. Since its inception, KMC Hospital has witnessed a significant evolution in communication methods. Initially reliant solely on telephone services, the hospital has embraced modern tools to enhance patient care. The introduction of mobile phones has revolutionized communication, offering patients not only efficient means of contacting the drive-and-take service but also serving as expert AI systems for effective vehicle management and coordination. Patients now have direct access to the service, facilitating faster response times and accurate assistance during emergencies.

Administrative tasks have also undergone a transformation, transitioning from traditional ledger-based record-keeping to computerized systems. Over the last five years, the hospital has utilized computers, which serve as expert AI tools, for patient enrollment and data management.

The emergence of hospitals not only introduces vital healthcare facilities but also opens up job prospects for five individuals transitioning from farming to the driving profession, propelled by the development of rule-based AI tailored for low-skilled workers. This historical shift reflects a significant transformation in employment dynamics, where individuals with farming backgrounds are transitioning into the driving sector to leverage advancements in technology. The latest technology, characterized by its ability to accommodate low-skilled workers with minimal training, owes its functionality to the integration of essential medical equipment such as patient monitoring machines, oximeters, and thermometers.

These technological innovations not only enhance patient care but also create avenues for job opportunities within the driving sector. Furthermore, the intuitive interface of the driving monitor display facilitates the assimilation of new drivers into the profession, contributing to the expansion of employment opportunities. As individuals from farming backgrounds transition to driving roles, they bring with them a diverse skill set and a willingness to adapt to evolving technological views, further enriching the driving profession and fostering economic growth within the healthcare sector. Thus, the establishment of hospitals serves as a catalyst for job creation, enabling individuals to capitalize on emerging technologies and embark on fulfilling careers in the driving profession.

Drivers undergo training to acquire proficiency in operating essential medical equipment such as the patient monitor, oximeter, thermometer, and driver display machine, all of which are classified as expert AI tools. While traditionally requiring expertise, these tools now accommodate low-skilled workers with relative ease, thereby reshaping the view of the driving profession. The advent of technology has enabled drivers to transition smoothly into their roles, with basic knowledge serving as a foundation for mastering these tools. Additionally, the introduction of cell phones has replaced traditional landline receivers at KMC, streamlining communication processes and further integrating technology into the driver's repertoire.

The evolving nature of expert AI tools signifies a departure from specialized roles, as common individuals assume responsibilities once reserved for experts. As a result, drivers are empowered to embrace new technologies and adapt to changing industry standards, facilitating the expansion of job opportunities within the driving sector. This transition underscores the democratization of expertise, as proficiency in operating advanced tools becomes increasingly accessible to individuals across various skill levels. Thus, the convergence of technology and training not only enhances the efficiency of drivers but also fosters inclusivity within the workforce, paving the way for a more dynamic and adaptable driving profession in the modern era.

The advent of user-friendly technology has facilitated the displacement of traditional nursing roles by low-skilled workers who now assume tasks previously reserved for experts. Despite the specialized nature of certain AI systems like patient monitors, oximeters, and thermometers, which traditionally required expert knowledge, these tools are now easily operated by drivers without these three nurses. Moreover, smartphones have supplanted traditional one telephone receivers, with features like Google Maps altering social dynamics by reducing reliance on interpersonal navigation assistance. Drivers also assume the role of computer operators, inputting patient data directly into KMC's systems and displacing the one need for dedicated personnel in administrative tasks.

Furthermore, vehicle indicators have streamlined driving processes, five diminishing the necessity for driver assistants during transit. Looking ahead, the emergence of self-driving vehicles heralds the eventual displacement of five drivers altogether. The shift underscores a broader trend towards automation and technological integration, reshaping traditional employment structures and necessitating adaptability among workers in an increasingly automated environment. As technology continues to evolve, the workforce must embrace innovation while navigating the challenges and opportunities presented by automation and the changing nature of work.

The evolution of technology presents a dual perspective in the context of driving vehicles and patient care services. On one hand, advancements offer new opportunities for driving vehicles, ushering in an era of enhanced efficiency and innovation. As unskilled workers transition from occupations like farming to driving roles, they enter a realm where the nature of work is rapidly changing. The transformation is evident as

unskilled individuals replace low-skilled drivers, harnessing the capabilities of AI systems within vehicles.

This shift not only redefines the view of employment but also fosters economic participation and skill development among workers. Concurrently, the emergence of effective service delivery mechanisms revolutionizes patient care. However, this transformation brings about job displacement in traditional sectors. As unskilled workers take on driving roles, the employment paradigm shifts, displacing three nursing experts and five driver helpers. Moreover, the integration of AI systems in vehicle operation and patient care services disrupts traditional roles, displacing a computer operator and a telephone receiver.

While these advancements improve efficiency, they also challenge established social relations and services, potentially causing conflict and societal harm. Hence, the significant influence of AI technologies underscores the necessity for proactive steps to tackle job displacement and alleviate social unrest. It is imperative to implement initiatives focused on retraining displaced workers and promoting comprehensive growth to navigate the dynamic labor environment and guarantee fair opportunities for everyone. Policymakers and stakeholders hold a crucial position in striking a balance between innovation and maintaining social harmony, shaping a future where technological progress aligns with societal welfare.

The integration of AI in driving vehicles and patient care services within institutions like KMC Hospital in Nepal reflects a profound transformation in employment dynamics and service delivery mechanisms. As technology advances, unskilled workers transition to driving roles, leveraging AI systems to enhance efficiency and innovation. This shift not only redefines the employment view but also fosters economic participation and skill development among workers. However, the integration of AI also brings about job displacement in traditional sectors, challenging established social relations and services. As unskilled workers assume driving roles, the paradigm shifts, displacing nursing experts and driver helpers, while AI systems replace roles like computer operators and telephone receivers.

While these advancements improve efficiency, they also necessitate proactive steps to tackle job displacement and alleviate social unrest. Policymakers and stakeholders play a crucial role in balancing innovation with societal welfare,

implementing initiatives focused on retraining displaced workers, and promoting comprehensive growth. By navigating the dynamic labor environment and ensuring fair opportunities for all, society can embrace technological progress while maintaining social harmony.

5.9 Use of AI and Creation, Replacement and Displacement of Employment in Pharmacy

The discourse revolves around the transformative influence of AI on the employment view within the pharmacy sector, as elucidated through various studies and perspectives. It underscores the expanding integration of AI into healthcare, particularly pharmacy practice, heralding a substantial metamorphosis in the roles of pharmacists. AI's applications in medicine are portrayed as augmenting patient care quality, streamlining medical workflow efficiency, and empowering healthcare professionals to scrutinize vast datasets for early disease detection and tailored treatment strategies.

According to a study looking to gauge pharmacy students' perspectives on AI's role in their education and future careers, the text also advocates for the integration of AI education into pharmacy curricula to give future pharmacists the necessary skills to navigate the evolving technological milieu and ethical quandaries associated with AI utilization in healthcare (Busch, 2024). It also talks about how automation technologies, such as digitalization and machine learning, are changing the jobs that pharmacists do. According to Lábaj & Majzlková (2021), automation is about to replace some human-held positions while also introducing new roles and responsibilities.

The text looks at different predictions of how likely it is that pharmacists will be automated and compares them to those of other healthcare professionals and retail workers. It also makes guesses about what might happen to the pharmacy industry as a result, such as a clear shift from tasks that are more related to retail to those that are more related to professional services. Empirical evidence from the Slovak labor market is cited to substantiate the relative displacement of employment from pharmaceutical technicians to pharmacists, potentially influenced by automation probabilities. It also shows how complicated the relationship is between automation, job roles, and the changing makeup of the pharmacy workforce (Mishra, 2018). This highlights the need for more research to fully understand how automation will affect future job trends.

Another topic that was talked about is the mutually beneficial relationship between AI and human expertise in pharmacy.

This includes the possible benefits of AI in improving medication use decisions, patient outcomes, population health, and cost savings, as well as the difficulties and complexities of effectively using AI in pharmacy practice (Flynn, 2019). The discourse also pivots around the integration of AI into the pharmaceutical industry and its corollary impact on the roles of pharmacists and pharmacy technicians, accentuating the transformative shift towards more clinically oriented practices and heightened accountability among pharmacists for the care they dispense (Mishra, 2023).

Additionally, it elucidates the opportunities AI provides for pharmacists to assume a more proactive stance in patient care, particularly within the framework of value-based care models, while also offering suggestions on how the profession can adapt to confront the exigencies posed by an expanding society and healthcare system. Throughout, the text underscores the multifaceted ramifications of AI integration in the pharmaceutical sphere, delineating its potential to reshape roles, redefine practices, and bolster pharmacy outcomes.

Within the pharmacy setting, the integration of technology, particularly AI systems, has significantly impacted operational efficiency and workforce dynamics. Three counters within the pharmacy are equipped with nine computers, strategically employed to optimize medication management processes and bolster efficiency, accuracy, and patient safety. These computers play a pivotal role in tasks such as inventory control, prescription processing, and administration, effectively reducing errors and streamlining workflow.

Decision support tools embedded within these systems offer pharmacists instant access to crucial patient data, empowering informed decision-making and enabling personalized care delivery (Adhikari, S., personal communication, September 17, 2023). Additionally, these systems' facilitation of electronic prescribing ensures seamless communication and adherence and supports initiatives for regulatory compliance and quality improvement through data analysis.

In tandem with these advancements, six calculators utilized across the counters aid in precise medication dosing and compounding, a critical component for patient safety and effective treatment (R. Tiwari, personal communication on September 17,

2023). Additionally, billing machines deployed at three different counters streamline transactions and ensure accurate financial management by swiftly generating invoices for medications dispensed, thus minimizing errors and enhancing operational efficiency (Yadav, A., personal communication, September 17, 2023). Concurrently, the utilization of smartphones by all staff members modernizes operations, facilitating efficient communication, access to medical resources, and real-time patient care coordination. Through medical apps and secure messaging platforms, pharmacists can verify dosages, check for interactions, and counsel patients remotely, thereby promoting medication safety and augmenting patient-centered care delivery. The incorporation of proper citation practices, as evidenced through personal communication references, underscores the acknowledgment of sources.

Overall, the integration of AI technologies within the pharmacy view represents a transformative shift, revolutionizing operations and advancing patient care standards. As for the hospital, it operates three pharmacy outlets along with a dedicated storeroom for medication storage, each equipped with four types of AI technology and staffed by 14 employees across three shifts to ensure round-the-clock service provision. Since 2021, an additional pharmacy has been incorporated, bringing the total to three. Positioned strategically, two pharmacies are situated at the hospital's front gate, while the third is conveniently located inside the hospital premises, adjacent to the canteen. Notably, the pharmacies prioritize the dispensation of medicines over external outlets, ensuring swift access to essential medications for patients.

The implementation of new technology in the pharmacy necessitates a corresponding update in the workforce. With the installation of computers requiring specialized knowledge, fresh opportunities emerge within the pharmacy sector. As noted in Adhikari's personal communication on September 17, 2023, the pharmacy now houses three computers, demanding expertise in network management and programming. This specialized skill set enables staff to access essential medical information and knowledge through specific programs and networks.

Moreover, the operation of billing machines entails proficiency in specialized programming, opening avenues for employment within the pharmacy. Overall, the integration of advanced technology not only enhances operational efficiency but also creates new job opportunities, demanding specialized skill sets in network management and programming.

The installation of computers marks a significant advancement in pharmacy, heralding the integration of AI technology to streamline operations and replace various traditional roles. Previously, a medicine watcher was employed to manage medication placement, a role now assumed by computer systems and operators. These systems effortlessly track medicine names and functions, effectively replacing the need for expert knowledge (Adhikari, S., personal communication, September 17, 2023). Additionally, they provide readily accessible information that previously necessitated expert consultation, thereby replacing the reliance on expert manpower.

Moreover, computer systems smoothly handle regular accounting tasks, rendering the need for ledger accountants redundant. Automated billing machines take the place of the conventional billing system, doing away with the need for manual billers. The adoption of smartphones supersedes conventional telephones, ensuring prompt service without the need for telephone receivers (R. Tiwari, personal communication on September 17, 2023). Calculators replace traditional manual calculation methods, further optimizing efficiency within the pharmacy setting. In essence, the integration of AI technology not only modernizes operations but also displaces traditional employment roles with automated solutions.

The introduction of the latest AI technology within the pharmacy setting has led to the displacement of traditional knowledge and personnel. The installation of computers has resulted in the displacement of two workers from the previous pharmacy setup. These computers now comprehensively handle tasks such as providing total information, managing accounts, and determining the optimal placement of medications. As a result, traditional workers who are unable to operate the computer systems have been displaced from their roles.

Furthermore, computer systems have displaced ledger accountants from their roles in managing pharmacy accounts knowledge (Adhikari, S., personal communication, September 17, 2023). One accountant has been displaced from the traditional pharmacy setup to oversee the implementation of accounting programs within the computer systems. Additionally, due to the integration of cutting-edge technology, one assistant has left the pharmacy because computer systems are now performing their duties. As a result, the implementation of AI technology has resulted in the displacement of traditional roles and personnel within the pharmacy because automated systems can now manage these tasks effectively.

The strategic placement of computers across three counters serves as an example of this shift because they are now essential for improving efficiency, ensuring patient safety, and optimizing medication management procedures. Decision support tools embedded within these systems empower pharmacists with instant access to critical patient data, thus reshaping the nature of decision-making and personalized care delivery (Adhikari, S., personal communication, September 17, 2023). Concurrently, automated billing machines and calculators streamline transactions and dosage calculations, respectively, displacing traditional roles such as ledger accountants and manual billers.

The use of AI technology also eliminates the need for human workers to perform tasks like medication administration and information retrieval because computer systems can now handle these duties effectively (Adhikari, S., personal communication, September 17, 2023). Consequently, the introduction of AI technology within the pharmacy setting has led to the displacement of traditional knowledge and personnel, marking a paradigm shift towards automated solutions for various operational tasks.

The integration of AI systems within the pharmacy view has ushered in a transformative shift, impacting both operational efficiency and workforce dynamics. With the installation of advanced technology, including computers and AI tools, traditional roles within the pharmacy are being displaced. Computer systems, equipped with decision support tools, electronic prescribing capabilities, and automated billing functionalities, have significantly reduced the need for manual intervention, displacing workers who previously managed tasks such as inventory control, prescription processing, and administration. As Adhikari (personal communication on September 17, 2023) highlighted, specialized knowledge in network management and programming has become essential for operating these systems, creating new job opportunities that demand expertise in these areas.

Furthermore, the implementation of AI technology has rendered roles such as ledger accountants redundant, as computer systems smoothly handle accounting tasks. Similar to this, traditional jobs like medicine watchers and assistants have disappeared because AI tools and systems are now capable of managing their duties effectively. As a result of automated solutions that streamline operations and raise patient care standards replacing traditional roles, the integration of AI technology has created conflict in the pharmacy workforce.

5.10 Discussion

Human civilization has always been dependent on technological change, which transforms work, social organization, and innovation. Harari (2011) dated the origins of this path to the cognitive revolution, which was the moment when humans acquired the consciousness and awareness to adapt to their environments. Lacking defenses such as horns or sharp teeth, they developed various tools and other ways to survive. Subsequently, they began to solve practical problems. The agricultural revolution potentially added to the original tension of human co-evolution by anchoring communities to fixed properties and introducing many new cultural, religious, and property systems, thereby creating more complexity, which facilitated continual innovation by humans and the refining of tools, machines, methods, and processes for enhanced efficiency and productivity. With changes in technology accelerating, the social order was beginning to shift, particularly in employment, which could be labelled as creation, replacement, and displacement trends, once again, that are important to the discussion of AI.

In health care, AI has become an advantage and a challenge. Although AI can process data, it cannot relate to the emotion of humans, which is one of the components of medical care. Jonson and Modani (2021) assert that the role of doctors and nurses is irreplaceable among the personal and compassionate treatment that cannot be replaced. AI can (as an example) evaluate a person's history to help inform clinical decisions, but the volume of data is often rendered best in light of a medical professional's experience and expertise, especially when AI is used in conjunction. Jain et al. (2021) argue, like many others, that the adoption of AI modifies skill requirements by replacing low-skilled activities with high-skilled ones.

For instance, healthcare workers and providers may need to adapt and reskill. Meanwhile, discussions of job displacement often fail to recognize that technological innovation simultaneously generates new roles. According to Hazarika (2020), the rate at which clinical data is increasing is causing additional demands and more work for care professionals. This can lead to burnout all while potentially creating an unreasonable stress, either through conflicting information within the data or resulting from expanding knowledge of finding ways to deliver quality, which can introduce unnecessary stress on professionals. Artificial intelligence has the potential to automate

tedious data collection, streamline processes, and improve efficiency, thereby relieving the stress of medical professionals.

The utility of AI in the field of psychiatry demonstrates its twofold character. While smartphone-enabled AI applications can collect large volumes of patient-level data and enable large-scale predictive analytics with observable treatment effects, as Brown et al. (2021) note, there are thoughtful aspects of psychiatric practice, including empathetic and verbal conversational elements, that human clinicians can take advantage of that cannot be replicated by AI (e.g., enhanced natural language processing). This is particularly troubling since the issues of bias and value alignment create a major hurdle to expanding applications of AI in clinical processes in psychiatric practice.

There is renewed attention towards AI and machine learning (ML) within pathology, specifically in digital pathology. Goldhahn, Rampton, and Spinaz (2018) celebrate the application of ML and deep learning for diagnostic accuracy by utilizing digitized slides. The advancements in digitizing entire glass slides using scanners offer enhanced ability of storage and access remotely, altering the landscape of pathology. Nonetheless, it is worth noting that, as Niazi et al. (2019) highlight, deep learning approaches have received critique regarding the lack of interpretative transparency, leading to regulatory concerns in light of the General Data Protection Regulation (GDPR). Granter et al. (2017) underline that AI will not replace pathologists but rather complement the pathways of human interpretations.

Radiology provides another viewpoint through which the employment implications of AI may be viewed. There is still an inadequate workforce in radiology despite the increasing demand for radiological services. Khurna et al. (2021) report that misconceptions about AI replacing radiologists prevented students from entering the field of radiology. However, there is potential for AI in radiology by streamlining the organization of workflows and assisting in the interpretation of diagnoses. Brandes et al. (2020) contend that the expansion of AI makes it impossible to decipher the future of radiology. Olthof et al. (2020) suggest that AI is a complement, not a replacement, for radiologists. Currently, 54% of AI applications in neuroradiology are primarily to support radiologists by detecting abnormalities and quantifying data.

AI impacts aspects of work beyond healthcare, including administrative roles, security, and even household labor. Within organizations, the automation of repetitive tasks such as scheduling and resource allocation grants human workers the challenge, creativity, and judgment of more strategic functions (Kolbjørnsrud et al., 2016). Security professions undergo a similar transformational process, including AI-driven tools that alter traditional roles in programming, data science, and cybersecurity while presenting ethical and policy implications (Osoba & Welser, 2017; Huang et al., 2016). Kennedy et al. (2015) extend these arguments into the household, suggesting that digital housekeeping defined as the division of labor and communication within households is changing how work gets done.

AI is also changing the professions related to mobility and pharmacy-related professions. In mobility, autonomous vehicles can help decrease costs for consumers, promote accessibility for prohibited populations, and create jobs in those fields (Chandavarkar & Nethravathi, 2023). In pharmacy, Busch (2024) argued that AI courses need to be included in a pharmacy school curriculum so students are prepared for the new frontier in the future. AI will replace some jobs because of automation, digitalization, and machine learning; the marked changes to professions will create new responsibilities and demonstrate an upheaval in professional practice (Lábaj & Majzlíková, 2021).

In conclusion, the literature reviewed demonstrates that while AI may improve efficiency and accuracy for all aspects of life, it is changing the work of key professions, who we work with, what is being earned, and professional ethics. While AI may eliminate some jobs, the consensus is that AI is intended to be supportive of what human beings do, since humans have skills that AI will not take over, like professional judgment, emotional intelligence, and ethical professional oversight.

CHAPTER VI

ARTIFICIAL INTELLIGENCE, EMPLOYMENT AND SOCIAL CONFLICTS IN KMC HOSPITAL

The most extensive application of AI worldwide to date has been in hospitals. This may be because human beings' foremost concern is their health and treatment, with the desire to restore and maintain well-being. Initially, humans seemed to use these tools mainly to meet their essential health needs. With the advancement of consciousness, people began to reflect on themselves and their conditions, thereby developing various forms of treatment to ensure good health. From Ayurvedic to homeopathic and allopathic practices, progress was made; however, the realization emerged that not all illnesses could be successfully treated through these means. Consequently, the use of AI in healthcare began, which marked a major advance in medical practice. This development has also left a notable impact on Nepal's healthcare sector.

As in the global context, the use of AI in hospitals in Nepal has also influenced the dimensions of employment, particularly in terms of job creation, replacement, and displacement. The forms of labor developed by humans to date physical, mental, and skilled work are now being significantly impacted by the emergence of AI. In Nepal, for instance, a private hospital that has been operating for twenty years has adopted rule-based and expert AI systems. Their gradual implementation across eight departments has revealed patterns of job creation, replacement, and displacement, which have brought notable disruption to the labor force. These changes have altered the very nature of work and, in turn, are gradually leaving a considerable impact on the broader labor market of KMC Hospital.

As AI is increasingly applied in hospitals, its influence on the three dimensions of employment creation, replacement, and displacement has begun to extend into the broader labor market. With AI demonstrating greater efficiency and capacity compared to human labor, these dynamics of job creation, replacement, and displacement appear to be generating social conflict. By affecting physical, mental, and skilled work, AI is moving in a direction that may intensify such conflicts within society. This is an area of inquiry that researchers have now begun to explore more deeply.

6.1 AI, Employment Creation and Social Conflicts

The widespread use of AI appears to be causing significant disruption in the labor market of hospitals. It has expanded employment opportunities while simultaneously fostering the potential for new forms of labor. By opening up possibilities for such opportunities, AI has not only contributed to job creation but has also been linked to the emergence of social conflicts. Although it provides opportunities, AI has also diminished the relevance of individuals' limited skills, thereby adversely affecting employment. Consequently, even as it generates new forms of labor, AI has not been able to sustain social harmony. According to Santoni de Sio (2024), AI may contribute to create new forms of oppression and violation of rights of the workforce. Thus, despite creating opportunities within employment, AI increasingly appears to be generating social conflict.

The development of new forms of technology has created complexities for employees whose knowledge is limited to traditional domains. The advancement of AI has specialized work processes, which in turn has further specialized human skills. As a result, the general workforce engaged in routine tasks is increasingly unable to operate AI with their existing abilities. According to Vodenko et.al (2022), the highest level of technological inequality emerges from automation based on robots, Big Data, and AI. This indicates that employment is becoming increasingly specialized, thereby limiting equal opportunities for all. Such specialization reflects both the opportunities and the challenges brought about by the development of new technologies in hospital employment.

The development of technologies such as AI has enhanced human efficiency. With less human labor, greater results can now be achieved, thereby increasing productivity. However, this progress has simultaneously rendered human knowledge, skills, and capacities less relevant in certain contexts. According to Shen and Zhang (2024), while AI and robotics have simplified tasks and delivered significant outcomes, they have also created barriers to the expansion of human labor:

The results of some mechanism studies show that the increase of labor productivity, the deepening of capital and the refinement of the division of labor that has been introduced into industrial enterprises through the introduction of robotics have successfully mitigated the damaging impact of the adoption of robot technology on

employment. Rather than the traditional perceptions of robotics crowding out labor jobs, the overall impact on the labor market has exerted a promotional effect. Despite this, as machine labor increasingly provides more opportunities than human labor, it has inevitably influenced human employment.

The application of AI in the healthcare sector has led to the increasing specialization of employment among doctors and nurses; there is a noticeable deficiency in the ability to utilize these technologies effectively, necessitating specialized knowledge. While AI has generated new job opportunities at KMC Hospital, it simultaneously demands advanced expertise, privileging those capable of updating their skills while displacing those who cannot adapt. As Thapa (2024) notes, While AI technology continues to revolutionize healthcare delivery and improve service quality at KMC Hospital, the collaborative integration of technology and human expertise serves to drive the hospital's commitment to embracing technological advancements while fostering professional growth opportunities for healthcare practitioners (personal communication, March 17, 2024). This situation highlights a knowledge gap among practicing doctors and nurses, whereby those able to acquire updated competencies secure employment, while others face displacement.

The development of opportunities is thus accompanied by conflicts arising from the absence of updated knowledge. According to Mahat (2023), The creation of new opportunities can create conflicts between new knowledge and new manpower to accumulate job opportunities (personal communication, May 18, 2023). AI in healthcare is highly specialized, displacing previous capabilities while generating new roles. However, this specialization also initiates conflicts between existing and emerging skills. The concentration of expertise among a limited number of professionals creates class hierarchies within society, further exacerbating conflicts. As traditional roles are eroded and new opportunities emerge, tensions between legacy capacities and newly demanded skills continue to intensify.

The results of sample testing, once reliant on human assistance, are now produced more rapidly through AI, thereby increasing the demand for specialized knowledge. Individuals equipped with such expertise gain access to new opportunities, whereas those without it encounter considerable challenges. As Magar (2023) explained, The critical role of AI tools in enhancing pathology services amid escalating demand, with a notable increase in sample testing necessitating technological upgrades

to meet the workload effectively, the integration of AI tools like the Beckman Coulter AU480 Machine has significantly improved processing efficiency, reducing turnaround times and increasing throughput (personal communication, May 24, 2023). Despite these advancements, the reliance on technology underscores the ongoing necessity of human expertise.

According to Karki (2023), explain human involvement remains indispensable in the use of technology; however, the growing demand is for individuals with new capabilities, which has prevented harmony between workers with traditional skills and those with newly acquired ones. This situation indicates that while AI has created demand for new workers and contributed to efficiency gains, existing workers who fail to update their skills risk obsolescence, further fueling the demand for a new and competent workforce. Consequently, laboratories experience tension between skilled newcomers and workers with outdated competencies.

Although AI generates opportunities, it simultaneously reduces the number of workers required, as faster execution is achieved by fewer individuals. This creates a paradoxical outcome where new employment is generated while overall job availability diminishes, introducing a potential employment crisis. The conflicts arising from these dynamics extend beyond the laboratory, exerting broader impacts on the employment market and potentially destabilizing social harmony through the advancing technology.

As newly developed AI technologies enter hospitals, there is a growing demand for a workforce equipped with advanced capabilities. With the introduction of modern MRI systems, existing workers often find their skills inadequate to operate these machines. These technologies possess characteristics fundamentally different from earlier systems, making prior competencies obsolete.

According to Mishra (2023), “The introduction of technologies like the 64-channel MRI machine and the Cath lab has prompted the creation of new job roles specifically tailored to their setup and operation” (personal communication, June 7, 2023). The installation of such equipment required entirely new personnel, thereby generating fresh employment opportunities, but at the same time rendering the skills of previous workers ineffective. This has contributed to conflict between newly trained and traditionally skilled workers. Furthermore, with all diagnostic reports now being

delivered in digital form, there is an increasing demand for employees proficient in technological systems.

As Mahat (2023) observed, the digitization of reports and the development of systems for home delivery of results have created “a demand for personnel with comprehensive knowledge of internet-based operations, leading to new opportunities for technologically skilled workers” (personal communication, May 18, 2023). These changes highlight that opportunities are increasingly reserved for individuals with specialized knowledge rather than those with general skills, intensifying conflicts between existing and emerging workers. Thus, in the radiology department of KMC Hospital, the integration of AI technologies has generated both new employment opportunities and significant challenges, underscoring the dual dynamics of job creation and social conflict in the coming days of social structure and employment.

At the time of the hospital’s establishment, only a limited number of administrative staff were employed, as the use of AI-based tools was minimal, reducing the need for a larger workforce. As AI technologies were gradually introduced, the number of employees also increased accordingly. Initially staffed with only 80 personnel, the hospital’s subsequent expansion required both structural and faculty growth, resulting in 616 individuals dedicated to administration.

While AI tools such as laptops, desktops, billing machines, and attendant machines have streamlined administrative operations and improved efficiency, they remain limited in performing social and relational tasks due to their inability to engage emotionally (P. P. Thapa, personal communication, May 9, 2023). In this way, the integration of technology has simultaneously generated new employment opportunities. Training programs provided to existing workers have enhanced their skills, thereby expanding their opportunities, while the demand for new, technologically capable workers has also grown.

However, workers lacking computer literacy or knowledge of emerging technologies are excluded from these opportunities, leading to visible conflicts between less skilled older employees and advanced, technologically proficient staff. To address this gap, training initiatives have been implemented, which themselves have contributed to job creation. Nevertheless, individuals unable to adapt or acquire new competencies are likely to remain deprived of opportunities, resulting in workplace

conflict. Such conflicts, if unresolved, are expected to intensify further in the future of KMC Hospital of Administration.

With the increasing use of AI in the field of security, the demand for a new category of workers has emerged. Security-related tools such as radios and metal detectors have enhanced safety measures, but their operation requires specific skills. Traditionally, guards relied solely on batons; however, they were unable to operate such modern devices, necessitating targeted training for these older employees in the KMC Hospital (L. Lamichhane, personal communication, July 11, 2023). Similarly, the KMC Hospital installation of CCTV cameras has further strengthened security.

These systems create opportunities for individuals capable of monitoring activities from a control room, identifying suspicious behavior, and taking immediate action to communicate with the team of security. However, many traditional security workers lack computer literacy and technical knowledge, preventing them from performing such tasks effectively. Consequently, while new employment opportunities have arisen, existing employees must undergo skill enhancement to remain employable. Those unable to adapt face the risk of exclusion. Thus, AI in the security sector has simultaneously created new jobs and challenges, contributing to potential conflicts within society.

In the course of technological advancement, AI-enabled tools have also begun to be utilized in the field of housekeeping, making work more efficient, convenient, and result-oriented. In KMC hospitals of Nepal, where tasks are often heavy, laborious, and difficult, AI-integrated machines have simplified operations. For example, the modernization of washing machines has enabled the quick and hygienic cleaning of clothes within a short period of time for a large number of clothes. Tasks that once required considerable time and manual effort can now be accomplished rapidly and effectively on the floor.

According to R. Makaju, traditional hand-washing consumed both excessive time and yielded poor results, whereas AI-assisted washing machines ensure cleaner outcomes in less time, simultaneously creating new employment opportunities (personal communication, August 5, 2023). Such innovations have brought significant ease to housekeeping and reduced the stigma once associated with the work, while also expanding employment opportunities. However, challenges remain for older workers.

Those unfamiliar with operating new technologies face the risk of job loss due to limited knowledge and skill confined to traditional manual labor. Similarly, the introduction of industrial washing machines has further enhanced efficiency and speed, but operating these devices requires technical competence. Workers lacking such skills are often excluded from these opportunities.

Thus, the integration of AI-driven technologies in housekeeping has shifted employment creation prospects toward workers with modern competencies, marginalizing those without. Over time, this trend may exacerbate disparities, whereby only skilled and technologically capable workers benefit from new job creation opportunities at KMC Hospital, while others face increasing displacement.

The use of AI in the transportation of KMC hospital has made driving more convenient and safer. When drivers fail to notice certain situations, AI-enabled systems provide immediate alerts through signals, thereby helping to prevent accidents. According to Om A. Magar, if a vehicle approaches from a blind spot or when another vehicle is overtaking, the system provides signals that allow the driver to remain aware and cautious (personal communication, September 2, 2023). Similarly, the integration of AI in hospital ambulances has enhanced patient care. For instance, advanced Category A ambulances rated by the government are equipped with monitoring systems that continuously track a patient's vital signs.

Such systems require trained nurses with technical knowledge to operate them effectively, as only they can provide proper care to patients through to the AI machine. Moreover, AI-enabled machines assist in determining which hospital can provide timely treatment based on the patient's health condition and travel time, further streamlining emergency responses to the scene the monitor. From driving safety to assessing patients' initial conditions, such technologies have introduced significant advantages. However, operating these systems demands new technical skills and knowledge. Those equipped with such competencies gain access to new job opportunities, whereas workers limited to traditional knowledge remain excluded from the KMC hospital. Consequently, the rise of AI technologies in transportation and healthcare has created divisions between new and old workers, generating conflicts that appear likely to intensify over time.

In the early days of KMC Hospital, there was only a single pharmacy. With the hospital's growth and expansion, the number has increased to five, thereby making it easier to meet the medical needs of patients. In the present context, the use of AI-enabled devices in these pharmacies has facilitated faster and more efficient services. Through computerized systems of the AI feature, complete information about medicines including their availability, composition, pricing, and methods of use can now be easily accessed.

Likewise, price reader machines can instantly provide information about the cost of medicines, enabling quicker service delivery. Accounting processes have also become more efficient with the use of computers and calculators. However, these systems require skilled human resources capable of operating them. As Adhikari (personal communication, September 17, 2023) emphasized, specialized knowledge in areas such as network management and programming has become essential for managing these systems, thereby creating new employment opportunities that demand expertise.

For individuals lacking such knowledge, however, these opportunities hold little value, as they risk being excluded from the emerging job market of KMC Hospital. Consequently, only workers equipped with the necessary technical skills and competencies are able to benefit, while older employees with limited exposure to new technologies face challenges when installing AI technology. This dynamic has generated new employment opportunities for some but has simultaneously created obstacles for others, ultimately fostering conflicts between traditional and modern workers in society.

In conclusion, the use of AI technologies at KMC Hospital has created both opportunities and conflicts in the labor market. On one hand, AI has improved efficiency, created specialized roles, and created job opportunities in 8 areas such as administration, pharmacy, security, housekeeping, radiology, and transportation. On the other hand, this technological progress has mainly benefited workers with updated technical skills while displacing those who rely on traditional skills.

This situation worsens inequalities and raises conflict between older and newer employees. Scholars like Santoni de Sio (2024), Vodenko et al. (2022), and Shen and Zhang (2024) point out that the specialization and automation linked to AI can create

productivity but also lead to social conflict by pushing out less skilled workers in the world of creation employment nature. Therefore, while AI is changing healthcare delivery for the better, its uneven impact highlights the need for ongoing skill development, fair access to training, and effective integration strategies to reduce conflict and maintain social harmony in the changing job area of the hospital.

6.2 AI, Employment Replacement and Social Conflicts

The conscious revolution marks the first instance in which humans learned to internalize and utilize technology. The ability to incorporate tools into daily life represented a fundamental cognitive breakthrough, transforming human existence and distinguishing humans from other species in this world. In this way, the application of technology facilitated the connection between humans and labor, enabling gradual innovation through the exercise of human consciousness, which has contributed to simplifying life.

However, with the advent of more advanced technologies, tools have increasingly functioned as mechanisms that separate humans from their labor. According to Estlund (2023), at least since the invention of the wheel, technology has significantly benefited humanity by both complementing and replacing human labor. Thus, while the meaningful engagement of human consciousness is evident in the assimilation of technology, the full development and application of these tools have begun to displace human labor. Smettan (2024) notes that AI presents opportunities and risks in dimensions previously unknown, likened to the “pink elephant in the room”; software developers compete to demonstrate capabilities, performance options, and new opportunities.

Consequently, humans who once engaged in labor are increasingly being replaced by technology across multiple domains. Over time, technological development has facilitated human adaptation to changing circumstances, mediating between temporal constraints and potential opportunities, thereby transforming work processes and increasingly substituting human effort (Li & Qi, 2022). Research indicates that while crises such as pandemics have negatively impacted employment, AI has demonstrated value in promoting employment, expanding opportunities for non-programmed interactive skills, and creating new positions for youth. In this context, technology has gradually reshaped labor structures, initiating replacement of both tasks

and workers themselves, illustrating a dual dynamic of innovation and workforce replacement.

The introduction of AI-integrated technologies in the healthcare sector at KMC Hospital has significantly enhanced the efficiency and accessibility of medical treatment. AI technologies can now provide care in locations previously unreachable by human doctors. According to A. Thapa (personal communication, March 17, 2024), robotic AI has enabled interventions in highly intricate areas of the human brain, making procedures feasible that were once extremely challenging. While AI has become indispensable for patient care, it has simultaneously generated issues of labor replacement.

For instance, surgeries that once required four doctors can now be effectively performed by a robotic AI system, with the assistance of a single doctor possessing specialized expertise. This robot can manage all eight operative instruments simultaneously, delivering care of higher quality than the combined efforts of the four previous doctors. Consequently, the technological advancement has effectively replaced multiple doctors in favor of a single physician with specialized AI knowledge. This dynamic illustrates a conflict between doctors with traditional competencies and those with advanced AI skills. The phenomenon highlights the replacement of human labor in healthcare and suggests that as AI continues to develop, these conflicts and employment replacements within the sector are likely to intensify.

Pathology is one of the core departments in hospital service delivery. At KMC Hospital, this department was initially managed by human laboratory technicians. With the advent of modernization, however, the department has experienced greater efficiency, speed, and reliability in its operations. The introduction of AI-powered machines has significantly transformed the workflow, enabling one operator with technical expertise to handle tasks that previously required multiple workers to hold the patient flow of the sample. According to A. T. Magar, machines such as the Beckman Coulter AU480 can process up to 900 samples per hour, a task that would have taken human technicians two to three days to complete (personal communication, May 12, 2023). While this has brought remarkable improvements in results, it has simultaneously replaced human labor. In the past, various specialists were required for different kinds of tests, but now, one person with specialized knowledge of operating AI systems can conduct all tests and provide results.

Consequently, many workers face displacement; for instance, 18 technicians currently employed in this department may no longer be necessary, despite being highly specialized compared to general workers. These specialists themselves have already displaced a significant number of other workers, and if not for legal obligations, an additional 10 employees could have been replaced by those with AI expertise. This trend demonstrates the continuous process of worker replacement, which is fostering growing conflict between traditionally skilled workers and those equipped with advanced AI knowledge. Moreover, management appears willing to pursue further replacements should legal constraints be removed, thereby deepening conflicts within the workforce.

The introduction of AI-enabled machines, such as the 64-channel MRI, in the radiology department of KMC Hospital has greatly facilitated diagnostic procedures. Complex diseases that were previously difficult or impossible to examine can now be assessed with ease. In earlier years, this department required approximately 20 employees; however, with the adoption of advanced AI technology, the same tasks can now be performed by only five staff members. Considering the development of new technologies and the improved outcomes they offer, the hospital incorporated AI-assisted systems, which have subsequently displaced traditional workers with employees possessing specialized knowledge.

According to P. Mishra (personal communication, June 7, 2023), the current workflow has become fully digital, requiring personnel capable of operating advanced systems. Consequently, the department has replaced older workers with individuals skilled in computer use, internet applications, and even data science. Moreover, the installation and operation of the MRI machines required the recruitment of skilled professionals from outside the hospital due to the lack of necessary expertise among existing staff of the radiology department.

This indicates that service delivery is now dependent either on enhancing the capacities of current employees or on introducing new, more qualified personnel. As a result, workers with traditional skills have been replaced by those with advanced competencies, leading to conflict between older and newer employees. This conflict, driven by the modernization of medical technology as an AI feature, is expected to intensify as advancements continue, whereas it intensifies the social conflicts.

The hospital's administration was initially established with approximately 80 employees. Over time, however, the workload and the number of patients increased, necessitating the gradual introduction of new equipment. With the installation of modern AI-based machines, employees who had previously relied solely on manual labor were replaced by new workers. According to N. Dahal, these newer employees were not of the same skill set as their predecessors but were instead appointed for their ability to operate advanced technologies such as computers, printers, internet-based systems, and data science applications (personal communication, July 10, 2023). Although the hospital initially employed fewer staff members due to limited use of AI technologies, the progressive incorporation of AI-enabled machines created a growing demand for workers with advanced competencies.

To address this need, the administration both enhanced the skills of existing employees and hired new staff members with specialized knowledge. This progression illustrates how, at the beginning, technological use was minimal, but as newer tools were integrated, reliance shifted from traditional skills to advanced capabilities, leading to the gradual replacement of older workers from the KMC Nepal. Consequently, conflicts began to emerge between employees with traditional expertise and those with modern competencies. Moreover, as the number of advanced tools increased without a proportional rise in the workforce, the replacement of older capacities by newer ones intensified workplace conflicts.

At KMC Nepal, security arrangements have been implemented to safeguard both patients and hospital equipment. To fulfill this requirement, the hospital administration has increasingly adopted various AI-enabled security tools. Initially, the administration relied primarily on human security personnel; however, in recent years, it has shifted toward technology-driven security systems. This transition has enhanced the efficiency of security operations while simultaneously creating a demand for new types of skilled personnel to run the AI technology. According to S. Ojha, one security group originally comprised 56 employees, but after the installation of CC cameras, the number was reduced to 34 (personal communication, May 20, 2023). Although the workforce decreased, the administration recognized that traditional skills alone were insufficient to address modern security needs.

Consequently, technologically adept employees were recruited to replace or retrain older staff. For instance, security personnel with expertise in operating detector

machines were deployed an ability that employees with only traditional skills could not provide. Therefore, older staff members who lacked the capacity to manage advanced equipment such as CC cameras, radio sets, and metal detectors were either replaced or required to undergo skill enhancement. This replacement process created conflicts between employees with outdated capabilities and newly recruited staff with modern expertise. A concrete example of this shift is evident in the reduction of the workforce from 56 to 34 employees, where older personnel were substituted with technologically skilled workers. Such developments suggest that as technological advancement accelerates, workplace conflicts related to capability gaps are likely to intensify further in the social structure.

The housekeeping department of KMC Nepal has long been responsible for maintaining overall cleanliness within the hospital. In the initial stages, all cleaning activities were entirely dependent on manual labor. However, over time, the use of technology has gradually increased, leading to the adoption of rule- and expert AI-enabled cleaning systems. This shift has significantly altered the outcomes of housekeeping operations. According to S. Poudel, four laundry machines now wash all of the hospital's linens, a task that requires only two workers operating in two shifts (personal communication, August 6, 2023). As a result, what previously required 24 employees is now completed by just 2 workers through the efficiency of technological capacity and expertise.

Similarly, two specialized machines for floor cleaning, operated by two skilled workers, have replaced the work previously performed by six employees. This demonstrates that the skills of older staff members have been replaced by the efficiency and technical competence of newly trained personnel. Consequently, tensions have arisen between employees with traditional skills and those with newly acquired capabilities. Each advancement in AI-based technology has further contributed to the replacement of older workers, thereby intensifying conflicts within the department. As AI technologies continue to evolve, such conflicts are expected to escalate further.

KMC Hospital has arranged ambulances for regular staff, students, owners, and patients. All such vehicles are equipped with rule-based AI systems, which have facilitated smoother transportation operations. According to O. A. Magar, driver monitors provide real-time information about vehicles ahead and behind, while side sensors alert drivers to overtaking vehicles, enabling better navigation and situational

awareness (personal communication, September 2, 2023). Drivers possessing expertise in these AI-enabled features are more likely to secure employment.

Furthermore, drivers familiar with the AI-enabled medical equipment in ambulances can even perform roles traditionally assigned to nurses in Category A ambulances. With the integration of monitoring devices, drivers can assess a patient's condition and determine the optimal hospital for timely treatment. Similarly, the introduction of mobile phones has allowed drivers to communicate with patients' families in route, effectively replacing traditional telephone operators. Consequently, drivers with new skills and competencies are increasingly occupying roles previously held by those with limited capabilities, generating conflicts between older and newer personnel. This dynamic reflects the growing conflict between traditional expertise and emerging AI-related skills in hospital transportation services.

Since its inception, KMC Hospital has maintained a pharmacy. With the growth and expansion of the hospital, the number of pharmacies has increased from one to five, facilitating the fulfillment of patients' medicinal needs of KMC patients. Similarly, the introduction of AI-enabled equipment in these pharmacies has enabled faster and more efficient service delivery. According to A. Yadav, computerized systems now provide comprehensive information about all medicines, including their location, application, dosage, and price, while price-reader machines allow immediate verification of medicine costs, thereby accelerating service provision (personal communication, September 17, 2023). The use of computers and calculators has also simplified accounting tasks, although such operations still require skilled personnel.

As Adhikari emphasized, specialized knowledge in network management and programming is essential for operating these systems, thereby creating new job opportunities that demand expertise (personal communication, September 17, 2023). Individuals lacking such technical knowledge have been gradually replaced by those equipped with it, leading to the substitution of workers with traditional skills by either upskilled employees or new, more competent personnel. This process has generated conflicts between long-standing employees and newly qualified staff. Workers unable to adapt to these technological requirements are at risk of exclusion from emerging opportunities. Consequently, access to new employment opportunities is increasingly contingent upon possessing advanced skills, highlighting a growing conflict between established and newly skilled workers in the hospital workforce by replacing them.

In conclusion, the incorporation of AI and technology throughout various departments of KMC Hospital has greatly influenced the efficiency in operations, service delivery, and workforce. On the one hand, these advancements have provided unparalleled advancements in services in health care, or diagnostics, administration, security, housekeeping, transportation, pharmacy, etc. On the other hand, these innovations have directly replaced workers with traditional skills. Established professionals with new technical capabilities or advanced knowledge have been completing jobs those established professionals once required most staff members to do using traditional knowledge.

This has created a transformation from labor-intensive tasks to technology-assisted tasks. The advancement and incorporation of KMC information technology, highlighted by multiple personnel (Thapa, 2024; Magar, 2023; Mishra, 2023; Dahal, 2023; Ojha, 2023; Poudel, 2023; Yadav, 2023; Adhikari, 2023), has led to a continuous series of conflicts between long-standing employees and those that are newly qualified, especially for those services in which it will impact their job ability when AI skills or technical knowledge is required.

Where AI is applied in developing AI [even thinking there were your past learning differences], its use should have helped develop accelerated productivity and capability, and then any conflicts arising from misalignment in capabilities should have prompted each facility to appeal to their human resources (in terms of the developing need for reskilling and upskilling and human resource planning). Therefore, while technology within KMC Hospital is an ongoing development with both exceptional benefits for their patients and operational outcomes, it also demonstrates the human workforce was disrupted socially and organizationally and was even more challenged with employing human knowledge not for advantage, but for AI or environmental changes.

6.3 AI, Employment Displacement and Social Conflicts

The ability to learn how to use tools marked the initial point at which humans began to distinguish themselves from the rest of the animal kingdom. Over time, humans emphasized the development and application of tools to make life easier. As tools evolved, the process of modernization eventually led to the emergence of artificial intelligence. Its advancement has raised global concerns, as AI has increasingly begun

to displace human labor in the employment sector. Wang and Lu (2024) examined the perceptions of 3,682 full-time workers regarding AI-induced job displacement risk and highlighted the potential complementary effects of AI on labor.

From the early stage of rule-based AI to the development of expert AI, the trajectory of technological advancement has reflected tendencies toward labor substitution. Such developments have generated multifaceted crises in the labor market, where traditional forms of employment are increasingly being displaced. Khan, Shad, Sethi, and Bibi (2024) noted that as AI capabilities advance, they pose a dual challenge: displacing employment, particularly in low-skilled domains, while simultaneously generating new opportunities in emerging sectors. Unlike previous stages of technological modernization, today's AI has displaced employment on a scale unprecedented in history. Zhitniaia et al. (2024) emphasized the potential of designing AI for social sustainability by adapting the Human-Centred AI model to mitigate AI-related job displacement.

The presence of AI is not limited to routine or repetitive tasks but is increasingly intruding into areas traditionally associated with human consciousness, suggesting widespread global displacement of labor. In Nepal as well, the growing application of AI has begun directly displacing employment, particularly in specialized domains such as healthcare services. For example, the use of AI at Kathmandu Medical College (KMC) Hospital demonstrates the manner in which technological specialization in medical service provision is gradually substituting human labor. As the application of AI in hospitals continues to expand, employment displacement has increasingly generated social conflict.

KMC identifies an ongoing conflict between technology and employment in health care as AI becomes integrated into medical services. According to A. Thapa, while technology is critical for enhancing service delivery and improving quality, it simultaneously leads to the displacement of human operators in hospitals (personal communication, March 17, 2024). The increasing ability of AI systems to perform complex tasks independently, using large-scale tools, is gradually reducing reliance on doctors and nurses. As stated previously, this undermines job security for health care professionals and changes how their work and roles are defined. Some people contend that AI helps people instead of replacing them. There is growing evidence that investments in AI have enabled machines to take over more tasks. The result is a

significant separation of human professionals from the essential parts of their work roles. As a result, the use of AI in health care signifies a transition into modernization while continuing to disrupt prospective employment so that shifts in work can accommodate new technologies. Ultimately, it seems that the jobs that physicians and nurses have historically fulfilled will also be displaced. What was formerly completed by four doctors is now semi-autonomously completed by CGM (cognitive generative machine) technology, by a single doctor. Inevitably, dislocated doctors are now competing for employment, and the conflict in the workplaces has intensified. This escalation of contradictions articulates the newer conflicts occasioned by newer AI forms of production.

The hospital's pathology department is seeing its workflow transformed by the use of AI, mainly through sample triage and moving away from human labor conversions towards processing efficiency, ultimately reducing the amount of human labor. According to A. T. Magar, this is the beginning of a new cohort of machines, such as the BECKMAN COULTER AU480 Machine, that process better and ultimately improve tests (personal communication, May 12, 2023). The functionality of existing lab staff is being removed in the context of the efficiency AI has provided, even though we are constantly having to increase staff due to the increasing demand for lab services. Although technology has ensured that the department is capable of processing a larger number of samples with a limited degree of human intervention, the staffing footprint will remain the same, meaning there will be periods when staff are displaceable, reiterating the tension between technological transformation and human labor.

There is potential for displaceable lab staff, and the need for balancing human labor and technology is delicate within the realm of diagnostics in healthcare. This tension points to a need for flexibility in regulation so that operational capacity links back to the appropriate number of human laborers and maximizes operational efficiency. The struggle of maximizing efficiency and workforce turnover through technological transformation within the healthcare setting highlights the importance of technology and labor interdependence and how they are divided. Although technology has allowed the department to process a substantially greater volume of samples with minimal human intervention, the existing staff structure has become increasingly redundant.

At present, the laboratory's machine is capable of analyzing approximately 900 samples per hour. Out of the 18 current laboratory employees, 10 positions would have been eliminated were it not for legal protections preventing dismissal, despite the lack of necessity for their labor. This situation indicates that the laboratory is already facing conditions of workforce displacement. Consequently, staff members are pushed toward unemployment, which in turn fosters societal conflict a phenomenon that appears likely to intensify as reliance on AI continues to expand.

AI technology in health care, as exemplified by KMC Hospital's radiology department, represents a major shift in practice and employment. AI technology provides unprecedented convenience and efficiency to patient care, but it is transforming traditional practices and roles in health care institutions. Radiologists and other professionals will need to assess and utilize AI systems as they continue to evolve and take new forms. The introduction of AI is displacing radiologist jobs overall but is shifting the need for these professionals to the requirement of specialists that can integrate AI into clinical practice.

In addition, AI technology is displacing certain roles within radiology, such as dispatchers and cleaners, where small, efficient, and flexible AI systems take up less space and will funnel patients correctly and eliminate the requirement of carting processors for imaging and cleaning. The overall position of technologists is declining at an alarming rate, and the health care profession will need to redefine roles and practice based on technological advancements. The movement of housing checks for the building entry from hand wands to metal detectors is displacing the need for professionals in this area. Handheld smartphone devices have taken the place of traditional telephones and quickly provided information that only doctors had. Handheld ultrasound and portable X-ray machines are eliminating the need for individuals in wheelchairs.

The premise is similar to the increase of AI and technology to redefine the relationship (can people live with AI and continue to deliver quality experiences) on employment in health care. This evolution demonstrates a substantial reconfiguration of the human-technology relationship in health care. Activities that previously required 100% human labor are now more frequently performed using machines, meaning that human roles are not center stage anymore. As the area of human work continues to

shrink, the pressure for work increases, creating a context that will likely amplify conflict both in the profession and in society.

KMC Hospital has undergone considerable workforce changes since it opened, as the incorporation of AI into administrative and operational routines has shifted traditional roles. Beginning with manual processes, Mahato (personal communication, May 18, 2023) indicates roles such as auditing, payments, data entry, and employee attendance have been automated more frequently by AI systems that are either expert or rule-based (such as computers, billing machines, or attendant systems). The workflow efficiencies afforded to KMC Hospital have resulted in roles previously held by full-time employees being filled with far fewer roles. This has displaced roles such as auditors, billers, ledger keepers, and other workers.

While AI can effectively replace actions or processes by reasoning or taking action, it does not replicate the social interactions and relations that necessitate human understanding, processing, and interactivity. The workforce of KMC Hospital now has to grapple with a twin dynamic: less role availability due to automation and more opportunities for management, maintenance, and monitoring of AI systems. This transformation has created tension between traditional workers and workers with technology-based skill sets; we are now seeing the causes of workplace conflict emerge and a very real need to reskill and adjust how we think about health administration as we seek to reconcile technological advancement with workforce equity and complexity.

The incorporation of AI technology in KMC Hospital's security operations has resulted in considerable changes to the workforce, emphasizing displacement from work but also social conflict. The KMC security initially relied on human personnel and was technologically sophisticated in its use of a few AI tools CC cameras, radios, metal detectors, smartphones, and computers. The integration of AI tools allowed KMC to use technology to streamline processes and simplify security operations, thus reducing the reliance on traditional security staff roles and resulting in the removal of 34 people from the security unit's original complement of 56 people (L. Gurung, personal communication, July 12, 2023). Although AI generated some new jobs, such as CC camera monitor observer, the elimination of unskilled workers highlights the tension between technology and economic displacement.

The increased skill sets required of those in a role in the security unit to operate and manage a system that utilizes AI, versus the unskilled worker left with no operational or management role altogether, present a potential for social conflict in the unit. This situation also sheds light on the larger challenge of balancing efficiency from the use of AI with human employment, as well as the need for reskilling and workforce policies to adapt to the ongoing technological advances in healthcare environments.

The introduction of artificial intelligence technology has disrupted the KMC Hospital housekeeping workforce by creating change, both through job loss and social conflict. Automation of manual work by the use of rule or expert AI technologies washing machines, hydro extractors, flooring cleaning machines, autoclaves, and grass cutters increasing the capacity and decreasing the number of workers required to do the same function (R. Makaju, personal communication, August 5, 2023) and helping to develop the flow of work and service, while changing the roles of workers, unskilled and skilled. Unfortunately, both options provide social conflict simultaneously.

The KMC Hospital combination of AI and skilled workers has led to new job positions, albeit requiring workers to operate advanced systems. These dual dynamic pieces highlight how the conversation of automation, displacement, and reconceptualization of job roles can simultaneously create conflict and inefficient operation. It must be redefined as a process with time, and strategies must be implemented to improve worker reskilling and future planning to curtail conflict due to transitional employment or competing operational efficiency.

A change in the working landscape for employment patterns and delivery of services can be observed with the use of AI and autonomous vehicles and moving aspects of patient care in organizations like the KMC Hospital in Nepal. As technology advances, unskilled laborers are taking up property driving for enabled AI systems and AI systems that enhance employment, creativity, efficiency, etc. New employment opportunities that redefine the work view are developing, and new employment patterns are making way for new skilled laborers as economic participants in the job market.

This transition also contributes to the displacement of workers from original uses of employment, and AI systems are breaking down patterns and established social relations and services. While unskilled laborers become drivers of the enabled vehicles with AI systems that can do more than driving, the nursing experts and driver helpers

become displaced. Roles like telephone receivers and computer operators get replaced with AI. The electric vehicle delivered enhanced efficiency, but it does bring some of the vehicle/software automation. Once displaced from work patterns, some employment markets for workers moved to the unemployed sector and had to install proper intervention processes to alleviate social unrest.

Policymakers and industry stakeholders need to develop and/or adopt a shared policy agenda to maintain a balance of innovation with those who might be impacted by it. A shared policy agenda that is enacted in a corporation, industry, and/or sector that promotes proper training opportunities for displaced workers, the future of economic growth, and society's ability to adapt to the future of work. Through adapting to the changing labor market, society can "catch up" to the innovation of the present day; however, it is important for all to find and maintain the opportunity to be part of a socially adaptive employment pattern.

The introduction of AI systems in the pharmacy view has created a paradigm shift impacting not only productivity and how we work but also the skills that we need to perform those tasks. As we install new technologies like computers and AI tools, the role of the pharmacy is changing. Specifically, technology has been developed that performs some of the functions that have previously been fulfilled by workers too. For example, computer systems with decision support, electronic prescribing, and automated billing have eliminated the need for many workers who did the functions of inventory manager, prescription manager, and administrative manager.

As Adhikari (personal communication on September 17, 2023) also showed us, now it is more important than ever for pharmacy workers to have specialized knowledge in programming and network management to use their systems to perform their duties while creating jobs in those special areas. Also, for example, we see accounting roles such as ledger accountant eliminated since the computer system performs all of the functions now. Similarly, we see that the role of medicine watchers and assistants is eliminated because their roles are now being performed by AI tools and other systems too. This is a consequence of the introduction of AI systems being implemented as alternatives to human pharmacy workers and displacing traditional pharmacy roles when there is a displacement of traditional workforce roles of human pharmacy workers.

In conclusion, the implementation of artificial intelligence by health care institutions such as KMC Hospital highlights the promise as well as the challenges that emerge with technological advances. AI has augmented the performance, efficiency, effectiveness, and creativity within multiple domains, including radiology, pathology, pharmacy, administration, safety and security, and housekeeping; however, these same advances in turn have dislocated former employments, especially for individuals who are marginal, specifically low-skilled and routine laborers. The consequences of AI could threaten job security among physicians, nurses, and health care workers.

AI can also increase the amount of strife in the workplace and lead to general chaos outside the workplace. Although AI has resulted in new work opportunities in fields that require emerging sector proficiency and technological knowledge, the introduction of these technologies has compounded the inequity between skilled and unskilled workers and displayed ambiguous dimensions of innovation and exclusion.

When the variables of the Nepalese context and the case of KMC Hospital demonstrate the overall use of AI and its involvement in job displacement, it challenges the relationship between humans and technology and reinforces the need for policies that create pathways for retraining, reskilling, and worksite adaptation, and further design practice for human-centered AI. Without these frameworks, the trajectory of AI adoption may replicate the pathways of unemployment and strife in the workplace, resulting in changes that are anything but sustainable or inclusive in health care or other sectors.

6.4 AI, Employment and Social Conflicts Resolution

Human beings have historically demonstrated themselves as conscious beings by integrating external tools into their lives, thereby establishing tools and technologies as inseparable components of human existence. By appropriating various external objects, features, and resources, humans gradually divorced themselves from the other species, enabling us to work more creatively and effectively to deal with life's crises. Tools facilitated human victories in conflicts with external forces predatory animals, storms, fires, and more making survival easier.

Over time, strategies developed to resolve crises, wars, and conflicts became paramount in the advancement of humans as a species. In the modern era of life on this planet, crises and conflicts have expanded in scale and complexity, and sorting through

the myriads of contemporary activities calls for an updated rationale and technology for resolution. Today's challenges extend beyond survival to learning to be together, to communicating, and to problem-solving at a more advanced level. By this standard, AI has become the essential tool for the continuation of conflict resolution in contemporary society.

Hsu and Chaudhary (2023) state that the ability to manage conflict without damaging relationships is increasingly important in a world facing heightened divisions. Traditional conflict resolution training, which relies heavily on one-off role-plays, is inadequate for developing the complex skill of communicating in conflict. Their web-based application emphasizes the potential of AI to offer automated, real-time feedback on language to allow users to avoid judgmental tones and other conflicts in response to conflict.

Their work exemplifies how higher-level problems require higher-level solutions. In today's societies conflict is not limited to the interactions between small groups; it has expanded into larger groups, as well as the wider avenues of language, data, and communication. This makes AI indispensable in achieving and maintaining resolution (Prusti & Pradhan, 2024). Most conflict is worsened by confusion or misinterpretation, while accurate and meaningfully exchanged words support resolution.

In this context, Tarafdar (2025) explains that AI applications in conflict resolution are widespread, existing in our personal relationships, workplaces, and even in public dialogue. With the help of natural language processing, multimodal input processing, and pattern recognition of conflicts, AI systems can recognize disputes and provide some possible directions for solutions. Deployment models, such as edge computing and cloud architecture, allow for AI systems to interface with communication platforms and monitoring systems for greater accessibility and impact. In this aspect, AI is a connector or bridge for conflict resolution in all its forms. This shows the important role AI can play in some of our most pressing contemporary challenges. All in all, AI technologies are reshaping not only how we resolve conflict but also how we sustain relationships and communications in an increasingly connected world through all social aspects, both natural and cultural, of humans.

6.5 Discussion

The quick expansion of advanced technologies has brought new challenges for workers who are skilled but are still limited to traditional fields. Work processes are becoming more specialized under automation and AI, which also means that workers have to upskill. It's then often the case that workers who complete often highly skilled, routine tasks do not necessarily have the skills to operate new, AI-enabled systems. Vodenko et al. (2022) claim that the level of "technological inequality" is most pronounced when automation occurs through robotics, Big Data, and AI, and show that the workforce is becoming increasingly compartmentalized. While this level of technological differentiation opens up potential, it also limits equitable access to jobs, particularly in a hospital context, where new tools are distorting traditional roles.

The separation of workers from their labor through technological tools has long been observed. Estlund (2023) highlights that since the invention of the wheel, technology has both complemented and replaced human labor, thereby delivering benefits while also displacing workers. While human consciousness has always been engaged in the assimilation of technology, the expansion of AI highlights the risk of further detachment of labor from human agency. Similarly, Smettan (2024) describes AI as a "pink elephant in the room," noting that the rapid competition among developers to demonstrate new capabilities introduces both opportunities and previously unknown risks.

AI has advanced from simple rule-based technologies to sophisticated expert systems, all with a consistent tendency for labor displacement. Each wave of AI has introduced new and complex disruptions in the labor market, wherein older employment arrangements become increasingly displaced. Khan, Shad, Sethi, and Bibi (2024) describe a dual impact of AI, first displacing low-skilled work while generating new employment in largely unknown fields. AI-generated job displacement differs from previous waves of technological modernization not only because it is occurring at an unprecedented scale in human history, but also because, to counterbalance the displacement, Zhitniaia et al. (2024) advocate for human-centered (based and focused on humans) AI models with principles of social sustainability where job loss does not expose risks, while benefits maximize society.

In addition to employment, AI becomes more relevant as a means of dealing with the complexities associated with social conflict. Hsu and Chaudhary (2023) note that in a divided world the ability to resolve conflict without damaging relationships has become ever more important. They critique conventional training, despite their facility with role-play-based training, such as one-off training interventions, as failing to cultivate the skills and opportunities with which to communicate nuanced instructions. Hsu and Chaudhary (2023), present a web-based application that uses AI as a means to provide automated, real-time feedback mechanisms that allow individuals to tailor language used, distance themselves from judgmental tones, topicalize, and provide constructive responses in conflict situations. This can be seen as a demonstration of how complex ‘higher-order social challenges’ may require more complex technical solutions, and it is furthered by Prusti and Pradhan (2024), who commented that conflict in the modern world also extends beyond intrapersonal forms of interaction and includes outsized societal forms of interactions such as language, data, and communication. In this manner, AI can not only be used as a mechanism to provide clarity, thus again preventing misunderstanding, but also be used as a mechanism to develop sustainable forms of resolution.

CHAPTER VII

SUMMARY, FINDINGS AND CONCLUSION

7.1 Summary

The integration of AI into various industries has sparked significant discourse regarding its implications for employment dynamics. As S. Zuboff (2019) notes, AI is fed into advanced manufacturing processes known as 'machine intelligence,' and fabricated into prediction products that anticipate what you will do now, soon, and late. This thesis focuses on the intersection of AI and employment within the hospital setting, with a specific emphasis on KMC Hospital in Nepal. AI manifests in different forms within the hospital environment, spanning rule-based systems to expert AI applications across its eight distinct sectors, including healthcare, pathology, radiology, administration, security, housekeeping, driving, and pharmacy. The study aims to understand how AI adoption affects employment patterns, encompassing the creation of new roles, replacement of existing ones, and displacement of physical, mental and skilled workers. It examines how the proliferation of AI technologies within hospitals generates societal conflicts and managing the future of work. By exploring AI deployment and its repercussions on employment, this thesis contributes insights into the evolving view of labor dynamics in the era of technological advancement. AI is a human-created machine endowed with imagination, intelligence, programming, and memory capabilities. While many machines in the world possess programming and memory, only a few exhibit intelligence. Humans program rule-based AI, which has memory and performs predetermined tasks under human direction. Expert AI, specialized in specific areas, utilizes intelligence through deep learning networks designed by humans for specific tasks. Both types of AI harness electric power for operation. These AI technologies are integral components associated with the operations at KMC Hospital.

The industrial revolution marked the beginning of the mechanization of human labor in a modern form. The development of the steam engine initially began to replace physical labor, followed by the integration of electricity and information technology, which gradually displaced mental labor. With the emergence of AI as the latest advancement, skilled work is also increasingly being automated, leading to a situation where humans may be excluded from all forms of labor. This trend has already begun

to manifest within the setting of KMC Hospital. While human progress was historically rooted in the stability of labor, the ongoing displacement of human labor raises critical questions about the future impact on society and the ways in which society will seek to resolve these challenges. Observing current trends, it appears that human displacement from labor is becoming increasingly inevitable.

The impending integration of AI tools into human society signifies a profound shift in the societal view, potentially disrupting established social structures. The thesis aims to comprehend the features of AI and the forthcoming society by analyzing these changes, thereby elucidating the reality of AI and its consequences. It seeks to understand the correlation between AI and employment, assess the influence of AI on employment patterns, including the creation, replacement, and displacement of jobs, and explore the emergence of social conflicts in this context. Furthermore, it endeavors to delve into the characteristics of a future AI society.

The study examines the impact of AI and its consequences on the areas of KMC Hospital in Nepal where AI is extensively utilized. The hospital setting is divided into 8 sectors, each with distinct employment characteristics. Given the nature of the data, a mixed-methods approach necessary to obtain comprehensive insights is employed. A purposive sampling method is chosen based on the nature of the respondents and the topic. This involves conducting interviews, non-participatory observations in the field, and utilizing secondary data from administrative and other sources.

7.2 Findings

The first findings to understand the relation between AI and employment reveal a positive correlation between AI tools and job creation across eight healthcare domains, notably evident at KMC Hospital in Nepal. As the scientists and engineers understood that the new data systems would produce an entirely new knowledge domain. Here, technologies such as robotic surgery systems, AI-powered diagnostic machines, and automated analyzers smoothly integrate into clinical workflows, revolutionizing medical practices and enhancing accuracy, efficiency, and patient outcomes at KMC.

Nevertheless, alongside these benefits come challenges and conflicts, including concerns about job displacement, the need for ongoing training and adaptation, and potential issues in resource allocation and capacity management. Despite the clear

advancements AI tools offer in diagnostics, treatment, and operational effectiveness, there's a consistent need to balance human expertise with technological capabilities to ensure optimal patient care. Across pathology, radiology, administration, security, housekeeping, and pharmacy departments, the integration of AI tools presents both opportunities for efficiency and concerns about traditional job roles.

The imperative of reskilling and upskilling initiatives to navigate these conflicts underscores the importance of maintaining job security and human expertise in healthcare delivery amid the rise of AI solutions. Meanwhile, within the KMC setting, the thesis focuses on assessing the utilization of AI, with the hospital boasting 120 AI tools across eight sectors, showcasing a steady expansion of AI's role in enhancing service delivery through technological advancements.

A total of 119 AI tools were found to be in use at KMC Hospital, primarily categorized under rule-based and expert AI systems. It was observed that expert AI was predominantly used in departments such as healthcare, pathology, and radiology, whereas rule-based AI was more commonly applied in departments like administration, security, housekeeping, driving, and pharmacy. Across the eight departments, the use of AI was seen to be increasing. While AI adoption was nominal during the hospital's early years, its use has steadily grown over time. Recently, the introduction of robotic AI and 64-channel MRI machines has further simplified and streamlined work processes, suggesting a growing trend toward the integration of AI in every area in the near future

The second finding pertains to understanding the impact of AI on employment, particularly in healthcare settings like KMC Hospital, where AI tools have both propelled advancements and posed challenges to employment dynamics. This exemplifies the delicate balance between technology and human expertise. In manufacture, the revolution in the mode of production begins with the labor power; in modern industry it begins with the instrument of labor. AI tools, while enhancing diagnostic precision and streamlining testing processes, require human oversight for effective utilization.

For instance, in critical care units and outpatient departments, AI-enhanced machines offer real-time data analysis but necessitate human interpretation for accurate monitoring and treatment decisions. Similarly, in laboratory and diagnostic

departments, automated analyzers prompt job reevaluation and adaptation among traditional roles, highlighting the importance of continuous training and skill development. Furthermore, challenges arise in resource allocation and capacity management, particularly in areas like ICU bed management and administrative tasks, where AI integration may lead to job displacement scenarios.

Concerns also loom over potential human role replacements by AI technologies in sectors like radiology and security, underscoring the necessity for retraining and upskilling initiatives to ensure workforce relevance among technological advancements. The symbiotic relationship between AI and employment within the KMC hospital setting underscores how AI enhances job tasks, thereby impacting employment dynamics and service quality. These connections are systematically explored throughout the thesis, utilizing variables identified within the hospital setting.

The integration of such AI technologies into the employment structure has shown varying effects sometimes contributing to job creation, other times to replacement, and increasingly to displacement. Rule-based AI has primarily been associated with job creation and replacement, while expert AI has been found to be more closely linked with job displacement.

For instance, with the installation of robotic AI, tasks that previously required four workers can now be performed by just one. Similarly, an AI machine used in the pathology department can analyze 900 samples in a single hour a task that would have taken human workers nearly two full days to complete. These developments indicate a clear shift in the employment area. While the earlier forms of AI influenced job creation and replacement, recent advancements, particularly in expert and robotic AI, have significantly accelerated the trend toward displacement.

The third finding of this analysis is to search the elaborate dynamics surrounding the creation, replacement, and displacement of employment within KMC Hospital's eight sectors. The team assumed that for all of its digital genius, the conscious would take its place as a modern incarnation of the ancient conventions that understand home as the private shelter of those who inhabit within its walls. The integration of AI technology within the hospital has organized significant shifts in employment dynamics, manifesting in the creation of new job roles as well as the replacement and displacement of existing ones. Initially, AI tools offered employment opportunities for skilled professionals adept at utilizing advanced equipment.

However, as technology advanced, traditional roles were gradually disappeared, resulting in the displacement of manual tasks and unskilled labor. This transformation has sparked a conflict between technological progress and established employment practices across eight departments, including pathology, radiology, administrative operations, security, and housekeeping within the hospital. While AI enhances operational efficiency and service quality, it simultaneously challenges traditional job structures, demanding the continual adaptation and reevaluation of roles within the healthcare sector. The displacement of human operators by AI running systems raises concerns regarding job security, underscoring the importance of ongoing training and upskilling to effectively navigate technological advancements within KMC Hospital.

Despite the potential for job displacement, it is imperative to achieve a harmonious integration of human expertise and technological innovation to foster inclusive and efficient work environments in KMC hospitals. Policymakers and stakeholders must strive to strike a balance between innovation and societal welfare to ensure equitable opportunities for all among the evolving technological view within the hospital.

In KMC Hospital, the use of both rule-based and expert AI was observed in nearly all of the 1,214 positions. For example, CCTV surveillance has replaced the need for storekeepers, while the number of security guards has been reduced from 56 to 36. In radiology, printing staff are no longer required due to the adoption of paperless technology, and ticket dispatchers have effectively replaced traditional ticket distributors. Similarly, in the pathology department, 18 workers would have been rendered redundant if not for legal obligations imposed by the government.

This trend reflects a broader pattern where both rule-based and expert AI systems have begun to displace workers across multiple sectors. As jobs are lost, some employees have organized and voiced their demands as a form of resistance, focusing the conflict emerging from job scarcity. However, many of those displaced have been pushed out of the institution entirely, without the opportunity to protest or negotiate internally, thereby shifting the site of conflict to broader societal and governmental levels, where conflicts are beginning to rise in the name of employment rights.

7.3 Conclusion

The first conclusion of the relationship between AI and employment within KMC Hospital's healthcare operations prompts a complex interplay between technology and employment dynamics, particularly evident in the radiology department. As advanced AI systems in healthcare, pathology, radiology, administration, security, housekeeping, driving, and pharmacy revolutionize working procedures, traditional roles undergo significant transformation. While 120 technologies enhance efficiency and accuracy, they also raise concerns about job displacement as machines gradually assume tasks once performed by human technicians. Consequently, the department witnesses a shift towards a leaner, more specialized workforce proficient in operating and interpreting AI equipment.

However, this transition underscores the need for ongoing training and upskilling initiatives to ensure seamless integration and optimal utilization of AI tools. Moreover, while AI augments operational capabilities, human expertise remains indispensable for result interpretation and maintaining personalized patient care. Thus, the changing view of radiology, pathology, and healthcare shows how difficult it is to find a balance between new technology and job security in healthcare settings. To get the most out of AI while still retaining the human touch in diagnosis and patient care, we need to work together.

The second conclusion about the impact of AI on employment in hospital settings, exemplified by the operations at KMC Hospital, underscores a transformative shift in employment dynamics and the relationship between technology and human roles. Across eight departments, AI tools augment efficiency and precision, impacting traditional job functions while creating new opportunities. For instance, in healthcare, pathology, and radiology departments, robotic systems and AI analysis enhance diagnostic accuracy and early detection.

However, challenges arise, such as technical malfunctions necessitating human intervention. Similarly, in healthcare, pathology, radiology, and outpatient settings, AI aids in data analysis but requires human expertise for interpretation and decision-making. Moreover, in laboratory settings, automated analyzers streamline processes but may displace traditional tasks, necessitating upskilling among technicians. Conflict emerges as AI replaces manual tasks, raising concerns about job displacement and the

evolving nature of roles. Nonetheless, the collaborative integration of AI and human expertise is essential for optimizing patient care and navigating the complex interplay between technological advancement and employment stability in healthcare settings.

The third conclusion comes from the perspectives of AI creating, replacing, and displacing employment and emerging conflict. The integration of AI technology within KMC Hospital has sparked significant transformations in job creation, replacement, and displacement dynamics across eight departments, leading to both harmony and conflict within society. Initially celebrated for its contribution to efficiency and quality in patient care, AI's pervasive presence has led to the displacement of traditional roles in the healthcare, pathology, radiology, administrative, security, housekeeping, driving, and pharmacy sectors.

While AI tools streamline processes and enhance productivity, they also raise concerns about job security and workforce displacement. The introduction of AI systems prompts the creation of new job roles while simultaneously rendering certain human tasks redundant. This conflict underscores the need for a balanced approach to integration, emphasizing the importance of human expertise in tasks beyond machine capabilities. Despite the challenges, the collaborative integration of technology and human expertise remains paramount for navigating the evolving view of employment within healthcare settings at KMC Hospital. As AI continues to reshape workforce dynamics, proactive measures are essential to mitigate job displacement, promote inclusive growth, and ensure societal harmony in the face of technological progress.

In conclusion, at KMC Hospital, the integration of rule-based and expert AI systems has significantly enhanced service quality, efficiency, and speed across eight departments, including healthcare, pathology, radiology, administration, security, housekeeping, driving, and pharmacy. While rule-based AI has mainly contributed to job creation and replacement, expert AI has increasingly led to job displacement, especially in complex and specialized tasks.

For instance, robotic AI has enabled a single worker to perform the work of four, and AI machines in pathology now complete in one hour what previously took two days. These developments have begun to reshape employment through processes of creation, replacement, and, particularly, displacement. The rising trend of AI-induced labor displacement is already visible, with some workers resisting while others face

exclusion without recourse, generating social conflicts and their management. As AI continues to transform labor dynamics, it signals a looming crisis in the current employment structure or the potential emergence of a new AI market system.

Using a post-positivist approach and qualitative methods, this study examines AI, employment, social conflict, and its management through the case of KMC Hospital. It reveals that an intelligence, once considered a unique product of the human mind, is now perceived as a property emerging from material entities. This transformation in the nature of an intelligence is evident in the development of rule-based and expert AI, which has evolved into more advanced forms. The rule and expert AI technologies currently employed at KMC Hospital reflect an increasing trend in AI adoption, indicating its growing capacity to provide faster and higher-quality services.

This shift has significantly altered physical, mental, and skilled labor, leading to processes of creation, replacement, and displacement. Among these, the latest phase of AI development has primarily resulted in displacement. This trend is disrupting existing social structures by mechanizing human labor and stripping individuals of their labor power, thereby generating new social conflicts. In seeking solutions to these conflicts, society appears to be moving toward structural transformation, giving rise to a new social order. This emerging societal framework represents a distinct departure from the present and offers a potential pathway for managing future conflicts.

7.4. Knowledge Contribution

The development of AI and its evolving relationship with employment demonstrate a fundamental shift in the force of production, which was historically limited to human labor. This shift reveals the emergence of new forms of social conflict and suggests that future societies will need to initiate new approaches to resolve such conflicts. For the first time in history, AI has posed critical questions regarding both human Intelligence and force of production that were once exclusive to human beings and central to employment. As a result, AI challenges the very foundational structures of human society. This thesis seeks to contribute to the understanding of such transformative dynamics by exploring the conflicts arising from these changes and identifying pathways to resolution that will shape the structure of future societies.

7.5 Recommendation

The integration of AI technology across eight departments within KMC Hospital emphasizes both the potential conflict and its management between technological innovation and traditional employment positions. While AI tools such as those in the healthcare, pathology, and radiology departments modernized processes and improve efficiency, they also pose challenges to existing job sectors, particularly in healthcare delivery, pathology, and radiology tasks. The displacement of certain roles, the creation of new positions adapted to AI integration, and the need for ongoing grounding emphasize the dynamic nature of employment in the face of technological advancement.

This conflict between technology and employment necessitates a balanced approach that ensures the optimal utilization of AI while preserving the indispensable role of human expertise and connection in healthcare settings. However, the recent transformation in the form of AI appears to displace humans from work. As quantum and genetic AI demonstrate a more advanced form than the present, they seem capable of operating at the human level. When AI functions in the same way as humans, it is likely to displace human labor. This can be incorporated into future research, as it represents a new area of inquiry.

ANNEXES

KEY RESPONDENT OF INTERVIEWING

Aman Thapa Magar, personal communication, May 12, 2023

Avishek Yadav, personal communication, September 17, 2023

Dr Amit. Thapa, personal communication, May 13, 2023

Dr. Jay Kumar Dash, personal communication, May 28, 2023

Lila Lamichhane, personal communication, July 11, 2023

Lokendra Gurung, personal communication, July 12, 2023

Meg Raj. Khadka, personal communication, May 11, 2023

Narayan Dahal, personal communication, July 10, 2023

Om Ale Magar, personal communication, September 2, 2023

Pradip Mishra, personal communication, Jun 7, 2023

Prem Prakash Thapa, personal communication, May 9, 2023

Rachha. Mahat, personal communication, May 18, 2023

Rajan Tiwari, personal communication, September 17, 2023

Ramaswor Makaju, personal communication, August 5, 2023

Saman Poudel, personal communication, August 6, 2023

Samjana. Karki, personal communication, May 24, 2023

Sapana. Roka, personal communication, May 12, 2023

Showan Adhikai, personal communication, September 17, 2023

Sunil. Ojha, personal communication, May 20, 2023

USED TOOLS OF AI IN KMC HOSPITAL

SN	Name of Equipment	Qty	Department	User
1	MRI	1	Radiology	Radiographer and radiologist
2	CT	1	Radiology	Radiographer and radiologist
3	DR System	3	Radiology	Radiographer
4	Portable Xray	8	Radiology	Radiographer
5	USG	8	Radiology	Radiologist
6	Poratble USG	6	Radiology	Radiologist
7	Ventilator	46	ICU	Doctor
8	Syringe Pump	150	ICU, ER, High care Post op, OT, HDU	Doctor, Nurse
9	Infusion Pump	100	ICU, ER, High care Post op, OT, HDU	Doctor, Nurse
10	Anaesthesia	12	OT	Anaesthesiologist
11	Patient Monitor	210	ICU, ER, High care Post op, OT, HDU	Doctor, Nurse
12	ECG	12	ICU, Ward	Doctor, Nurse
13	Defibrillator	15	ICU, Cathlab, High care, ER	Doctor
16	Catherization Laboratory	1	Interventional Radiology	Radiologist
17	Dialysis Machine	9	Haemodialysis unit	Dialysis Technician, Nurse
18	Operating Microscope	6	OT	Surgeons
19	Cautery	10	OT	Surgeons
20	CTG	2	Gynae ward	doctor
21	Incubator	2	Nicu	Doctor
22	Baby Warmer	40	Nicu	doct0r
23	Laser	2	OT	Surgeons
24	OT Lght	12	OT	ot Technicians/Assistant
25	OT table	12	OT	ot Technicians/Assistant
26	ICU bed	33	ICU	nurse/ dooctor
27	Mammography	1	Radiology	Radiographer
28	Echo machine	2	Cardio OPD	Cardiologist
29	TMT Machine	2	Cardio OPD	Trained user(Nurse)
30	PFT	1	Pulmo OPD	Trained user(Nurse)
32	Endoscopy	3	Gastro Medicine	Doctor
33	Audiometry	1	Speech and hearing	Audiologist
34	Fibroscan	1	diagnostic	Trained user(Nurse)
35	EEG	4	Neuro	Trained user(Nurse)
36	EMG	2	Neuro	Trained user (Nurse)
37	Autoclave	3	CSSD	Trained user
38	ETO	1	CSSD	Trained user
39	AB scan	1	Eye OPD	Ophthalmologist
40	Auto refractor	2	Eye OPD	Ophthalmologist
41	Humphrey Machine	1	Eye OPD	Ophthalmologist
42	Slit lamp	3	Eye OPD	Ophthalmologist
43	Lensometer	1	Eye OPD	Ophthalmologist
44	CPM Machine	2	Physiotherapy	Physiotherapist
45	Electrotherapy	1	Physiotherapy	Physiotherapist
46	IFT machine	1	Physiotherapy	Physiotherapist
47	Intermiten Traction	1	Physiotherapy	Physiotherapist
48	Muscle Stimulator	1	Physiotherapy	Physiotherapist
49	Short Wave Diathermy	1	Physiotherapy	Physiotherapist
50	Ultrasonic Therapy	1	Physiotherapy	Physiotherapist
51	Dental Chair	10	Dental OPD	Trained user
52	Dental Xray	1	Dental OPD	Radiogarpher
53	Ultrasonic cleaner	1	Dental OPD	Trained user
54	C-arm	8	OT	Radiographer
55	Phototherapy Machine	1	Dermatology	trained user
56	Cautery	1	Dermatology	trained user
57	Laser	1	Dermatology	trained user
58	Iontophoresis	1	Dermatology	Trained user

THE INTERVIEWING CHECKLIST

- 1) List of Artificial Intelligence Applications.
- 2) What is the impact of using AI in daily work?
- 3) How effective are the results obtained using AI tools?
- 4) Does AI aid in employment creation?
- 5) Can AI potentially replace employment?
- 6) Can AI lead to displacement of employment?
- 7) What are the projected employment trends in relation to AI usage?
- 8) Does AI contribute to conflicts in employment?

INSTITUTIONAL REVIEW COMMITTEE LETTER



Institutional Review Committee (IRC) Kathmandu Medical College Public Ltd.

Sinamangal

(Affiliated to Ethical Review Board, Nepal Health Research Council)

Ref.:21042023/01

Date: - April 21, 2023

Chairperson

Prof. Dr. Sunil Kumar Joshi

Member Secretary

Dr. Deepak Regmi

Members

Dr. Pratibha Manandhar

Dr. Gita Khakurel

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Ms. Aasmin Pyakurel

Mr. Teertha Prasad Poudel

Administrative Assistant

Mr. Karun Ghimire

Address for correspondence:

Kathmandu Medical College
Institutional Review Committee
PO Box 21266, Sinamangal, Kathmandu,
Nepal
Tel: 977 1 4469064, 4476152 Ext. 3513
Email: kmc.irc@gmail.com

To whom it may concern

This is to inform that **Mr. Prakash Adhikari**, PhD Degree student from Tribhuvan University, Department of **Conflict, Peace, and Development studies** has been granted ethical approval by the IRC KMC for the study of **“Artificial Intelligence and Employment: an Analysis of Emerging Social Conflict.”** on April 21, 2023.

Data collection period: May – October 2023

Study site: Kathmandu Medical College.

Prof. Dr. Sunil Kumar Joshi
Chairperson
Institutional Review Committee
Kathmandu Medical College

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