A STUDY ON ADAPTATION OF SKILL SETS IN THE AGE OF ARTIFICIAL INTELLIGENCE; PORTRAIT OF THE MODERN KNOWLEDGE WORKER

Dr.V.Chitra
Assistant Professor,
Department of Commerce
Arulmigu Arthanareeswarar Arts and Science College
Tiruchengode TK, Namakkal-Dt

Dr.V.Senthil kumar
Associate Professor
PG & Research Department in Commerce,
Vivekanandha College of Arts & Sciences for Women (Autonomous),
Elayampalayam, Tiruchengode.

Dr.S.Senthil Kumar
Director - Management Studies,
Coimbatore Marine College,
Coimbatore

Abstract

The advent of artificial intelligence (AI) has catalyzed significant transformations across various sectors, demanding a reevaluation of the skill sets required for modern knowledge workers. The article explores the dynamic landscape of AI-driven workplaces and the evolving competencies necessary to thrive in this environment. It highlights the shift from traditional knowledge-based skills to more adaptive, cognitive, and interpersonal abilities. As AI increasingly automates routine tasks, the emphasis for workers has shifted towards higher-order thinking, creativity, emotional intelligence, and lifelong learning. Artificial intelligence is redefining the boundaries of human capabilities and transforming job roles across various industries. The modern knowledge worker must navigate a complex interplay of technological advancements.. The article investigates how AI is reshaping the skill sets required for knowledge workers and provides insights into the competencies that will be essential in the near future. AI's integration into the workplace has led to the automation of many routine and repetitive tasks, necessitating a shift in the focus of human labor. Job roles are evolving, with a growing demand for skills that complement rather than compete with AI. This transition underscores the need for workers to develop a hybrid set of skills that include both technical proficiency and uniquely human attributes.

Keywords: Artificial Intelligence, Knowledge Worker, Skill Sets, Automation, Cognitive Skills, Emotional Intelligence, Lifelong Learning, Workplace Adaptation.

Introduction

By addressing workers' concerns and engaging them in the AI integration process, organizations can mitigate distrust and foster a culture of acceptance and cooperation, ensuring a smoother transition towards AI-enabled workplaces. This includes the ability to operate AI tools, understand data analytics, and utilize software platforms relevant to their job functions. Technical skills enable workers to leverage AI technologies to streamline processes, analyze data more efficiently, and derive insights to inform decision-making. Human skills are essential for effective collaboration and communication in AI-enabled workplaces. Workers must possess interpersonal skills such as teamwork, empathy, and conflict resolution to collaborate with colleagues and AI systems alike. These skills facilitate smooth interactions between humans and AI, fostering a collaborative environment where both can contribute their unique strengths. Conceptual skills involve critical thinking, problem-solving, and adaptability to navigate the complexities of AI integration in the workplace. Conceptual skills enable workers to adapt to changing circumstances, innovate solutions, and identify new opportunities arising from AI advancements. By cultivating a balance of technical, human, and conceptual skills among workers, organizations can promote successful coexistence between humans and AI in the workplace. This holistic approach empowers workers to harness the potential of AI technologies while preserving the unique capabilities that make them invaluable contributors to organizational success.

Emerging themes and research agenda

Several emerging themes and a burgeoning research agenda are shaping this discourse:

1. **Skill Enhancement and Reskilling**: Exploring how AI can be leveraged to augment human capabilities and facilitate skill development is crucial. Research in this area delves into identifying the skills that are complementary to AI and designing training programs to enhance these skills.
2. **Ethical and Social Implications**: Examining the ethical implications of AI integration in the workplace is essential. This includes issues related to job displacement, privacy concerns, bias in AI algorithms, and the impact on employee well-being.
3. **Job Design and Task Allocation**: Understanding how AI can influence job design and the allocation of tasks is another key area of research.
4. **Regulatory and Policy Considerations**: Exploring the regulatory frameworks and policy guidelines needed to govern the responsible use of AI in the workplace is crucial. Research in this area addresses issues such as data privacy, algorithmic accountability, and worker rights.
5. **Long-Term Societal Impact**: This involves forecasting future employment trends, examining income inequality, and exploring the implications for social welfare systems. By addressing these emerging themes and research agendas, scholars and practitioners can contribute to the development of strategies and policies that promote the responsible integration of AI in the workplace while maximizing its benefits for both workers and organizations.
6.

Figure: 01

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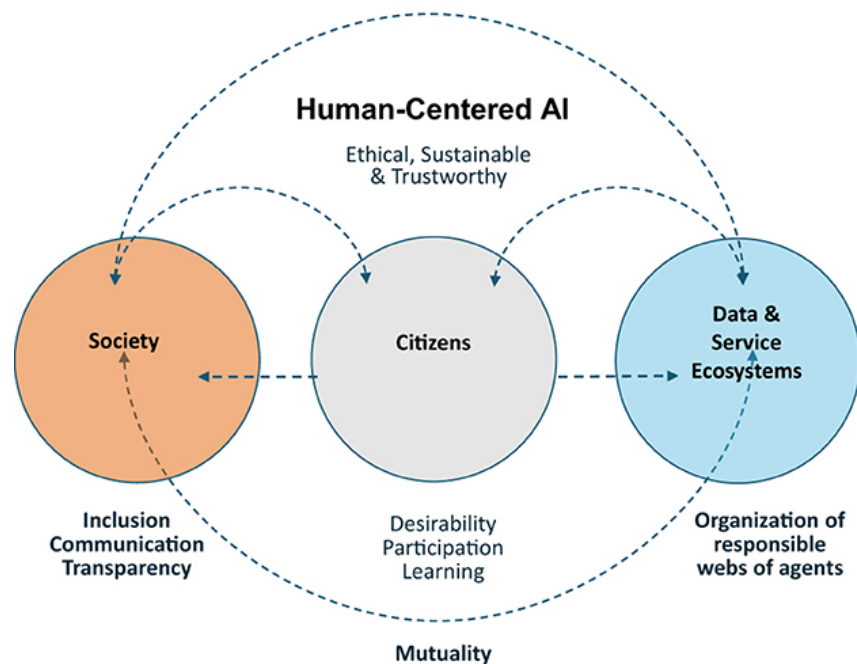
Evolving Skill Sets

Cognitive Flexibility: In the age of AI, this skill has become paramount for modern knowledge workers. As AI technologies rapidly evolve, so do the tasks and challenges faced in the workplace. Knowledge workers must be adept at adapting their thought processes to keep pace with these changes. This involves not only learning new tools and technologies but also being able to shift strategies and approaches when confronted with new data or unforeseen obstacles. Cognitive flexibility enables workers to pivot quickly in response to shifting priorities, integrate diverse sources of information, and develop innovative solutions that leverage both human intuition and AI capabilities. This agility in thinking is crucial for navigating the complexities of an AI-driven environment, where the ability to adapt and respond to dynamic situations can significantly enhance productivity and innovation.

Critical Thinking: As AI handles more routine and data-intensive tasks, human workers are increasingly called upon to interpret AI outputs, identify underlying issues, and devise effective solutions. This skill is crucial for understanding the implications of AI-generated insights and making decisions that align with organizational goals. Problem-solving, on the other hand, requires a structured approach to identifying, analyzing, and resolving issues. It involves creativity, logical reasoning, and the ability to anticipate potential challenges. In an environment where AI continuously evolves, knowledge workers must be adept at diagnosing problems quickly and efficiently, using both human intuition and AI tools to develop and implement innovative solutions. Together, these skills enable workers to add value beyond what AI can offer, ensuring that they remain integral to the decision-

making process and contribute to the organization's success.

Creativity and Innovation: Creativity and innovation are increasingly crucial in the age of AI, distinguishing human contributions from automated processes. Knowledge workers must harness their creative potential to envision new possibilities, develop unique solutions, and drive innovation within their organizations. This involves not only generating novel ideas but also fostering an environment where experimentation and risk-taking are encouraged. Innovation often arises from the ability to connect disparate concepts, challenge conventional thinking, and view problems from fresh perspectives. By leveraging their creativity, knowledge workers can complement AI's capabilities, leading to breakthroughs that machines alone cannot achieve. Furthermore, creativity is essential in designing user-centric AI applications and interfaces that enhance user experience and adoption. In essence, while AI handles the "how," creativity addresses the "what" and "why," ensuring that technological advancements are aligned with human needs and aspirations. As a result, creativity and innovation are indispensable for sustaining competitive advantage and driving progress in an AI-enhanced workplace.

Emotional Intelligence (EQ): Emotional Intelligence (EQ) has become a cornerstone skill for knowledge workers in the AI era, as the automation of technical tasks shifts the focus to interpersonal dynamics and human-centric roles. This skill is crucial for effective communication, collaboration, and leadership in increasingly diverse and interconnected work environments. High EQ enables knowledge workers to navigate complex social interactions, resolve conflicts, and foster a positive workplace culture. It also enhances empathy, allowing individuals to better understand and respond to the needs and concerns of colleagues and clients. As AI systems lack emotional awareness, human workers with strong EQ can bridge the gap by ensuring that technology serves to augment rather than alienate the human experience. By leveraging emotional intelligence, knowledge workers can build stronger teams, improve customer relations, and drive organizational success through improved morale and engagement. Ultimately, EQ distinguishes human contributions in an AI-driven world, ensuring that technology enhances rather than diminishes the quality of work and life.

Digital Literacy: Digital literacy is a foundational skill for knowledge workers in the AI era, encompassing the ability to effectively and efficiently use digital technologies to gather, evaluate, and communicate information. This proficiency involves understanding how AI and other digital tools function, including their capabilities, limitations, and ethical implications. Knowledge workers must be adept at using a variety of software applications, platforms, and devices to perform their tasks, as well as staying updated on emerging technologies and trends. Digital literacy also includes data literacy— the ability to interpret and leverage data insights generated by AI systems to inform decision-making and strategic planning. In an increasingly digital workplace, being digitally literate enables workers to automate repetitive tasks, enhance productivity, and collaborate seamlessly across virtual environments. Moreover, digital literacy ensures that workers can critically assess digital information and navigate the complexities of cyber security, privacy, and digital ethics. As organizations continue to integrate AI and digital technologies into their operations, digital literacy will remain a critical competency, empowering knowledge workers to harness the full potential of these tools and drive innovation and efficiency.

Lifelong Learning: Lifelong learning is an essential mindset and practice for knowledge workers in the AI age, characterized by the continuous pursuit of skills and knowledge throughout one's career. Instead, they must commit to ongoing education and skill development to remain relevant and competitive. Lifelong learning involves engaging in various forms of learning, such as online courses, workshops, seminars, and self-directed study, to acquire new competencies and adapt to changing industry demands. By embracing lifelong learning, knowledge workers can enhance their adaptability, resilience, and innovation, positioning themselves to capitalize on new opportunities and navigate career transitions effectively.

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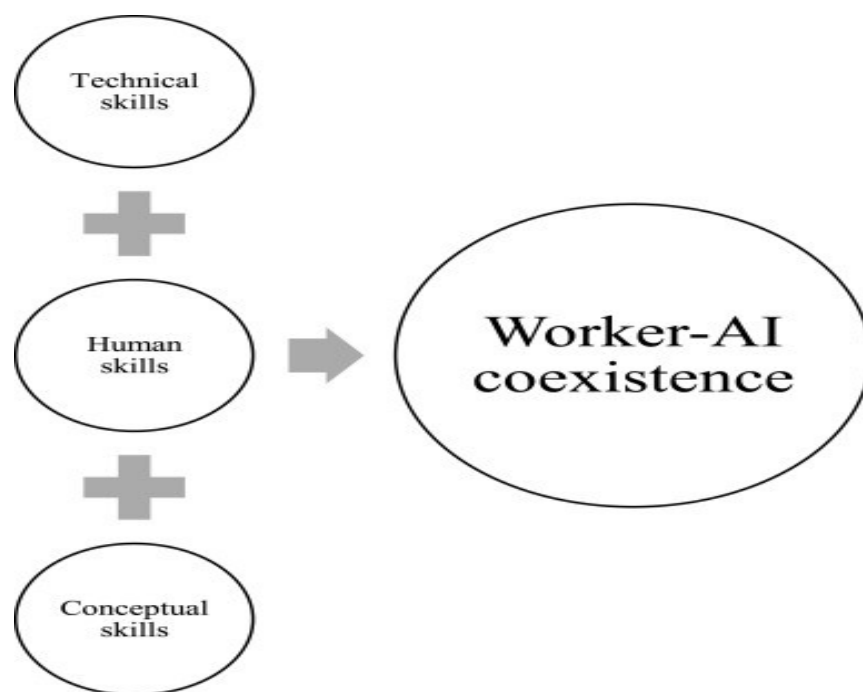
Artificial Intelligence and the Modern Productivity Paradox

Despite significant investments in AI and other advanced technologies, productivity growth in many sectors has stagnated or even declined. This paradox highlights a complex interplay between technological potential and actual economic performance, revealing several underlying factors that contribute to this conundrum. Implementing AI systems often requires substantial upfront investment in infrastructure, training, and process reengineering. Organizations must navigate the learning curve associated with integrating AI into their operations, which can initially disrupt workflows and diminish short-term productivity. Moreover, the benefits of AI are not always immediately apparent; they accrue over time as systems become more refined and employees become more adept at leveraging these tools. Another factor contributing to the productivity paradox is the disparity in AI adoption across different industries and firms. While some sectors, such as finance and healthcare, have rapidly embraced AI,

others lag due to regulatory constraints, lack of expertise, or insufficient resources. Even within industries, larger firms with more capital can implement AI more effectively than smaller enterprises, exacerbating productivity disparities. This uneven adoption can distort overall productivity statistics, masking the gains achieved by early adopters. The nature of AI-driven productivity gains also plays a role in the paradox. AI excels at automating routine tasks and enhancing data-driven decision-making, leading to significant efficiencies in specific areas. However, these efficiencies often translate into incremental improvements rather than transformative leaps in productivity. Additionally, the displacement of certain jobs by AI can lead to transitional unemployment and underemployment, further complicating productivity metrics. The reallocation of labor from automated tasks to more complex, value-added activities requires time and adjustment, during which productivity gains may not be fully realized. Human factors and organizational culture also influence the productivity outcomes of AI implementation. Resistance to change, fear of job loss, and lack of digital literacy can impede the effective use of AI technologies. Furthermore, the productivity paradox is partly a measurement issue. Traditional productivity metrics often fail to capture the full spectrum of AI's impact. Many benefits of AI, such as improved customer experience, enhanced decision-making, and innovation potential, are intangible and difficult to quantify.

Figure: 03

Human-centered artificial intelligence
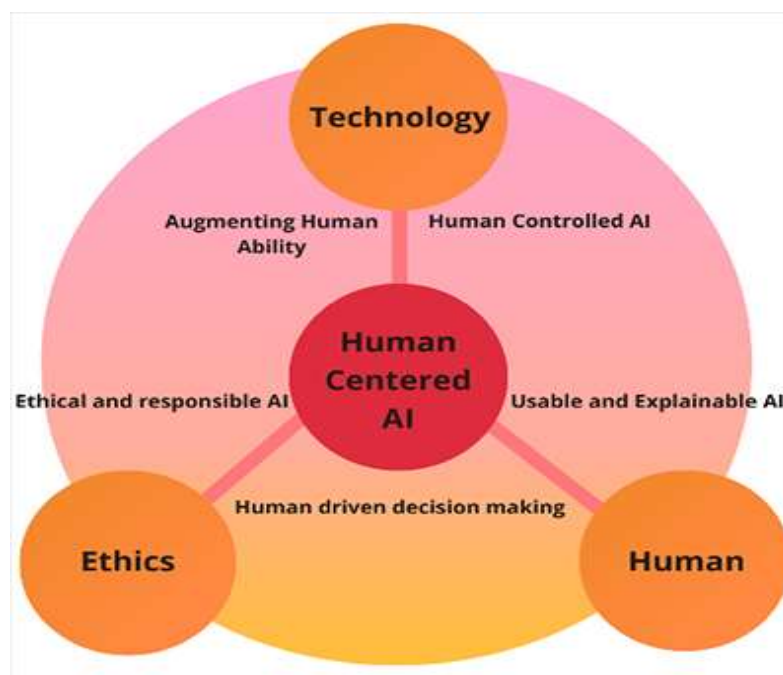
Advances in Artificial Intelligence

Linking advances in artificial intelligence (AI) to occupational abilities involves developing a structured approach to integrate AI capabilities with the skills required in various job roles. This paper proposes a method to achieve this alignment, emphasizing the identification of relevant AI technologies, the mapping of these technologies to occupational tasks, and the continuous adaptation of workforce skills. However, to fully harness these benefits, it is essential to link AI advancements with the abilities required in various occupations. This paper outlines a method to achieve this integration, focusing on identifying AI capabilities, mapping them to occupational tasks, and continuously updating workforce skills to keep pace with technological developments.

Identification of Relevant AI Technologies: The first step involves identifying AI technologies that are relevant to specific industries and job roles. Industry-specific AI applications should be highlighted, such as predictive analytics in finance, diagnostic tools in healthcare, and automation in manufacturing. Engaging with AI experts and conducting industry analysis can provide insights into the most impactful technologies.

Mapping AI Capabilities to Occupational Tasks: Once relevant AI technologies are identified, the next step is to map these capabilities to specific occupational tasks. This involves analyzing job roles to determine which tasks can be automated or enhanced by AI. Creating detailed task inventories for various job roles helps in identifying the areas where AI can add value.

Skill Gap Analysis: This involves evaluating existing employee competencies and identifying areas where additional training or new skills are needed. The analysis should consider both technical skills, such as proficiency in using AI tools.

Training and Development Programs: Partnering with educational institutions, online learning platforms, and AI vendors can facilitate access to high-quality training resources. Additionally, creating mentorship and peer-learning opportunities can support continuous skill development. Organizations should regularly review and update their training programs to reflect the latest technological advancements and industry trends. Encouraging a culture of lifelong learning and adaptability ensures that employees remain competitive and can effectively leverage AI in their roles.

Future of Employment: Jobs to Computerization

The rapid advancement of artificial intelligence and automation technologies has sparked debates about the future of employment and the potential impact on various job roles. The paper examined the susceptibility of jobs to computerization, drawing on insights from academic research and empirical studies. Utilizing data-driven methodologies, including job task analysis and machine learning algorithms, it identifies key factors influencing job vulnerability and explores implications for workforce adaptation and policy development [9]. The paper analyzes the factors influencing job vulnerability to computerization and examines strategies for workforce adaptation in an increasingly automated economy. By identifying relevant AI technologies, mapping them to occupational tasks,

conducting skill gap analyses, and implementing targeted training programs, organizations can enhance productivity and facilitate workforce transition. Continuous monitoring and adaptation are crucial to keeping pace with technological developments and ensuring that the workforce remains equipped to harness the full potential of AI. This method not only maximizes the benefits of AI but also supports a sustainable and resilient workforce in the evolving job market.

Assessing Job Vulnerability to Computerization: Studies on job susceptibility to computerization often utilize job task analysis to identify tasks that are amenable to automation. Jobs in manufacturing, administration, and customer service, which involve a significant proportion of routine tasks, are particularly vulnerable to automation. However, the impact of computerization varies across occupations and industries. While some jobs may be fully automated, others may undergo partial automation, with certain tasks being automated while others remain reliant on human judgment and creativity. Moreover, the complementarily between AI and human labor suggests that automation may not necessarily lead to job displacement but rather a restructuring of job roles and skill requirements.

Factors Influencing Job Vulnerability: The degree of task routineness and predictability is a primary determinant, with highly routine tasks being more easily automated. Additionally, the availability and cost-effectiveness of automation technologies play a crucial role in shaping job vulnerability. Jobs that require high levels of manual dexterity, social intelligence, and creativity are less susceptible to automation, as these skills are challenging to replicate with current AI capabilities. Furthermore, organizational and institutional factors, such as industry regulations, workforce demographics, and cultural norms,. Jobs in sectors with high regulatory barriers or strong labor unions may experience slower rates of automation compared to more deregulated industries.

Analysis, findings and Results

The impact of age on the adaptation of skill sets among employees is a multifaceted issue. Younger employees often exhibit a higher degree of flexibility and adaptability, quickly acquiring new skills, especially those related to emerging technologies. This agility is partly due to their recent education and greater familiarity with digital tools. In contrast, older employees may face challenges in adapting to new skill sets due to established routines and potential discomfort with rapidly changing technology. However, they bring invaluable experience, institutional knowledge, and problem-solving skills honed over years of practice. Organizations can foster an inclusive environment by implementing continuous learning programs and leveraging the strengths of a multigenerational workforce. By providing tailored training and fostering mentorship opportunities, companies can ensure that employees of all ages remain proficient and adaptable; ultimately enhancing overall productivity and innovation.300 sample respondents were selected by using simple random sampling.

Table 1

Results of the chi-square test among adaptation of Skill Sets and the Age group of employee

Age group	Level of influence			Total
	Low	Moderate	High	Total
Young	37	22	20	79
	46.8%	27.8%	25.3%	100.0%
Middle	34	49	54	137
	24.8%	35.8%	39.4%	100.0%
Old	28	36	20	84
	33.3%	42.9%	23.8%	100.0%
Total	99	107	94	300
	33.0%	35.7%	31.3%	100.0%
Chi-square value	3.328			
difference	4			
CC	0.066			
p-value	0.349			

Table 1 shows the chi-square test results for the level of influence and the age group of employees in the study area. The computed chi-square and p-value for the level of influence and the age group of employees are 3.328 & 0.349. The p-value is >0.05. Therefore, the study concluded that there is no association between the level of influence and the age group of employees. As automation technologies continue to advance, workforce adaptation becomes imperative for ensuring resilience and competitiveness in the labor market. This involves upskilling and reskilling workers to perform tasks that complement AI and automation, such as creative problem-solving, complex decision-making, and human-centered roles that require empathy and interpersonal skills. Policy development plays a crucial role in facilitating workforce adaptation and mitigating the adverse effects of automation.

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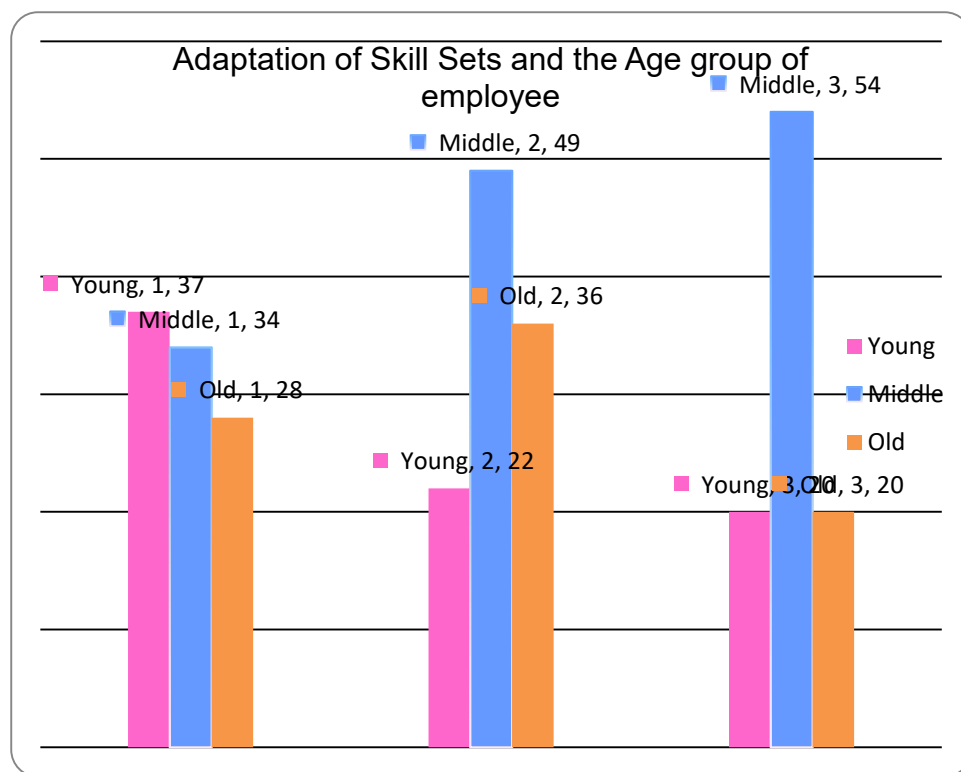
Policies focused on education and training, lifelong learning, and income support can help workers transition to new roles and industries. Additionally, measures to promote labor market flexibility, such as portable benefits and income security mechanisms, can provide workers with greater economic stability amidst technological disruptions. The article encapsulates key insights from research and analysis on how automation is reshaping the labor market and driving a demand for new skill sets. This shift towards more cognitive and interpersonal tasks underscores the importance of lifelong learning and skill development to remain relevant in the workforce. Manufacturing, administrative, and customer service roles are particularly susceptible to automation, with machines increasingly capable of performing routine tasks more efficiently than humans. To navigate the changing landscape of work, individuals, organizations, and policymakers must prioritize skill development and education initiatives. Workers need to adapt to the demands of an increasingly digital and automated economy by acquiring skills that complement automation, such as data analysis, programming, and human-centered roles like care giving and customer service. Moreover, policymakers must address the challenges posed by automation through strategic policy interventions, including investments in education and training, support for lifelong learning initiatives, and the development of social safety nets to assist displaced workers.

Contribution to theory, practice, and policy

The adaptation of skill sets in the age of AI represents a transformative shift in the workplace landscape, necessitating contributions to theory, practice, and policy to ensure successful integration.

Theory Contribution:

1. **Skill Taxonomy Refinement**: Building upon existing skill taxonomies, theories should refine definitions to reflect the nuances of AI-driven environments. This includes delineating between AI-complementary technical skills, human-centric interaction proficiencies, and strategic conceptual competencies.

2. **Human-AI Interaction Models**: Developing robust theoretical models of human-AI interaction is crucial. These models should explore factors influencing collaboration dynamics, such as trust, communication patterns, and decision-making processes. By elucidating these interactions, theories can guide the design of AI systems that enhance rather than replace human capabilities.

3. **Continual Learning Frameworks**: Theoretical frameworks on adult learning and professional development must evolve to incorporate the need for continual skill adaptation in AI-driven environments. This includes exploring personalized learning pathways tailored to individuals' evolving roles and the integration of AI-driven adaptive learning technologies.

Practice Contribution:

1. **Skill Development Programs**: Practically, organizations must design skill development programs that cater to the diverse needs of workers in the AI age. These programs should offer training in technical proficiencies, such as data analysis and AI tool operation, alongside soft skills like teamwork and emotional intelligence. By addressing this multifaceted skill demand, organizations can empower workers to thrive in AI-enabled roles.

2. **Cross-Disciplinary Collaboration Platforms**: Creating platforms for cross-disciplinary collaboration fosters the exchange of knowledge and skills essential for effective human-AI coexistence. These platforms facilitate teamwork, communication, and the integration of diverse perspectives, enabling workers to leverage AI technologies for innovative problem-solving and decision-making.

3. **Work Arrangements**: This includes initiatives such as job rotation, sabbaticals for upskilling, and remote learning opportunities. By supporting a culture of continuous learning and adaptation, organizations can enhance workforce resilience in the face of AI-induced changes.

Policy Contribution:

1. **Education and Training Policies**: Policymakers should prioritize education and training policies that equip individuals with the skills necessary for AI-driven workplaces. This includes

integrating AI literacy into educational curricula, promoting lifelong learning initiatives, and incentivizing employers to invest in employee training programs.

2. **Workforce Transition Support**: Policies should address the potential disruptions caused by AI-driven automation, offering support to workers transitioning between roles or industries. This may involve establishing reskilling funds, providing unemployment insurance with training benefits, and offering career counseling services.

3. **Ethical Guidelines for AI Implementation**: Policymakers must develop ethical guidelines to govern the responsible implementation of AI in the workplace.

Conclusion:

In navigating the adaptation of skill sets in the age of AI, contributions to theory, practice, and policy are essential for fostering a workforce equipped to thrive amidst technological disruption. By refining theoretical frameworks, implementing practical skill development initiatives, and enacting supportive policies, stakeholders can collaboratively shape a future where humans and AI coexist harmoniously, maximizing the benefits of technological advancement while mitigating its potential drawbacks. The portrait of the modern knowledge worker is one characterized by adaptability, creativity, and emotional intelligence. As AI continues to advance, these competencies will distinguish successful professionals from their peers. Embracing the evolution of skill sets is not only imperative for individual career success but also for organizational competitiveness in the AI era. The future of work in the age of AI necessitates a redefined skill set for knowledge workers. By fostering cognitive flexibility, critical thinking, creativity, emotional intelligence, digital literacy, and a commitment to lifelong learning, workers and organizations alike can thrive amidst the ongoing technological revolution. The adaptation of skill sets in the age of AI presents both challenges and opportunities. Workers may face anxiety and resistance to change, highlighting the need for supportive measures such as retraining programs and a culture of continuous learning. The future of employment is intricately linked to the ongoing advancement of AI and automation technologies. While automation has the potential to reshape the labor market and disrupt traditional job roles, its impact is contingent upon various factors, including task characteristics, technological capabilities, and institutional frameworks. By understanding the factors influencing job vulnerability and implementing proactive strategies for workforce adaptation and policy development, societies can navigate the transition to an automated economy while maximizing the benefits of technological innovation. In conclusion, the modern productivity paradox underscores the complexities of integrating AI into the economy. While AI holds immense potential to drive efficiency and innovation, realizing its full benefits requires overcoming significant challenges related to adoption, workforce adaptation, and measurement. Addressing these issues involves a multifaceted approach, including investing in digital infrastructure, fostering a culture of lifelong learning, and developing new metrics to capture the nuanced impacts of AI. As organizations and economies navigate this transition, the ultimate promise of AI—transforming productivity and unlocking new levels of economic growth—remains an evolving and long-term endeavor.

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