

The Innovations and Trends of Information Technology with AI: Weapons to Reassemble the Future World

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Abstract

Information Technology or AI, a combination of computer science, logic, biology, psychology, and philosophy, is set to dominate our future, revolutionizing social progress, labor productivity, and cost reduction. It is essential for AI database integration and the next generation of computing, supporting Intelligent Information Systems and distributed cooperative labor. AI and IT integration are enhancing efficiency, creativity, and digital capabilities, with applications in customer service, healthcare, personalized medicine, and driverless cars. The paper tends to review the developments and trends in information technology using artificial intelligence (AI) as weapons to re-build the future world. With qualitative analysis of previous research studies, the paper tries to explain the role of AI in present information flow as well as for future. And after studying the selective papers it efficiently explains the advantage of AI in both human and environmental way. AI has the potential to significantly impact our lives, but fundamental questions remain unanswered about its extent, scope, and timeline. Current tools are insufficient to predict future AI achievements or fully comprehend its capabilities. To determine the readiness level for different technologies with AI, criteria are defined based on historical evolution. AI has revolutionized the IT industry, improving efficiency, productivity, and quality. However, concerns arise about the potential impact on the workforce, with concerns about job redundancy and potential unjust outcomes in critical areas like employment, finance, and law enforcement.

Keywords

Artificial Intelligence, Technical World, Intelligence Augmentation, Technology Advantage, Cybersecurity

1. Introduction

Our upcoming future will be more dominated by AI. The last two decades' technological advancements build on the work of earlier decades in which humanity achieved technological progress, laying the groundwork for the development of machines and algorithms that may one day be able to create consciousness on their own for the first time in human history [1]-[3]. People produce petabytes of new information every second in the modern era of technology, and the rise of big data has presented both benefits and challenges exclusive to humanity [4]-[7]. Researchers work to wring value out of vast, ever-expanding data sets. Experts like Peter Drucker and Alvin Toffler have referred to the current period as the "knowledge economy" or the "information age". Douglas Engelbert was the one who initially recognized the significance of computer technologies in creativity of human.

Computers and telecommunications equipment used for data storage, retrieval, transmission, and manipulation are all included in information technology. Information processing and management tools include networks, hardware, software, and services [8]. The term artificial intelligence describes how technology, especially computer systems, mimic human intellectual functions. Learning (gaining knowledge and applying rules to it), reasoning (using rules to arrive at broad or precise conclusions), and self-correction are some of these processes. When it comes to data administration and processing, IT supplies the necessary infrastructure and tools, but AI enhances these capabilities by allowing computers to carry out jobs that have historically included human intelligence. Together, they significantly influence the direction of technology and spur innovation across numerous industries [9]-[14].

The phrase AI refers to the science of artificial intelligence. This method simulates and trains computers to mimic human intelligence, including learning, judgment, and decision-making. AI is a project that uses knowledge as the item collects knowledge, assesses its expression techniques, and simulates human intellectual activities [15]-[20]. AI combines computer science, logic, biology, psychology, philosophy, and other disciplines to achieve impressive results in speech recognition, image processing, natural language processing, automatic theorem proving, and intelligent robots. Artificial intelligence (AI) has revolutionized social progress. AI is essential to the advancement of society and has produced groundbreaking improvements in labor productivity, labor cost reduction, human resource structure optimization, and the creation of new employment demands. It utilizes human ingenuity and abilities on a large scale [21]-[28].

AI and database integration is crucial not only for the successful application of much AI technologies and the advancement of database technology, but also for the next generation of computing, which will support Intelligent Information Systems and be based on distributed cooperative labor [29]. Due of these possible contributions, AI database integration is far more essential than one may expect based just on its contribution to the advancement of AI and database technologies [1] [30]-[35]. As a result, AI database integration will make a substantial contribution to scientific and technological infrastructure, as well as corporate and humanitarian computer applications [36]-[44].

A vision of future computing includes a framework and goals for AI database integration. The short- and long-term benefits are demonstrated, and the crucial need for improvement is highlighted [45]. Artificial Intelligence continues to lead technological progress. AI and machine learning are becoming increasingly advanced, with applications ranging from bettering customer service with chatbots to bettering healthcare diagnoses [46] [47]. AI is also essential to the advancement of customized medicine and driverless cars. More advanced data analysis, automation, and decision-making capabilities are being made possible by advancements in AI. This covers everything, from AI in finance to improve predictive models to AI in healthcare to enable individualized medication [48].

In order to produce value, address issues, and enhance quality of life, technology breakthroughs must be harnessed. This is why trends and innovations at the intersection of IT and AI are studied. Stakeholders may navigate the quickly changing world of AI and IT integration with confidence and foresight by being proactive in identifying these trends and remaining informed [45]. Information technology (IT) is being profoundly changed by artificial intelligence (AI) in a number of ways that support efficiency, creativity, and the advancement of digital capabilities. Large amounts of data are processed quickly and accurately by AI-powered analytics, which also extracts useful insights that help with decision-making [15] [49]-[51]. IT teams may improve service delivery, allocate resources more efficiently, and predict trends with the use of techniques like machine learning and predictive analytics [52]. By continuously learning from data and improving procedures, AI maximizes IT operations. This covers the distribution of resources, tracking of performance, and proactive maintenance of IT infrastructure. Improved cost-effectiveness, scalability, and dependability in IT operations are the results [53]. Automation of repetitious procedures and duties in IT operations is made possible by AI. This covers network administration, system monitoring, automated data entry, and even cybersecurity duties like threat identification and response. AI improves overall efficiency by lowering operating expenses and manual labour [8]. AI systems accurately evaluate medical pictures (MRIs, X-rays, etc.) to help radiologists diagnose diseases like tumors or fractures. AI can identify trends in medical data to forecast illnesses ahead of time, enhancing prognosis and therapeutic results [54].

Medical imaging informatics encompasses the application of information and

communication technologies (ICT) to medical imaging for healthcare services. Over the past 30 years, a broad range of multidisciplinary medical imaging services has evolved, spanning routine clinical practices to advanced studies of human physiology and pathophysiology [54]. Originally defined by the Society for Imaging Informatics in Medicine (SIIM), the field covers the entire imaging process: from image creation and acquisition, through distribution, management, storage, and retrieval, to processing, analysis, understanding, visualization, interpretation, reporting, and communication. It serves as an integrative catalyst across these processes, bridging imaging with other medical disciplines [55].

The primary objective, according to SIIM, is to enhance the efficiency, accuracy, and reliability of medical services within complex healthcare systems, focusing on the usage and exchange of medical images [56]. With technological advances in big data imaging, omics, electronic health records (EHR) analytics, dynamic workflow optimization, context-awareness, and visualization, medical imaging informatics is ushering in a new era conducive to precision medicine [46]. This evolution is driving clinical research, translation, and practice, aiming to discover actionable insights. Challenges in standardizing workflows and processes have prompted new paradigms, including multi-institutional collaborations, formation of extended research teams, open-access datasets with well-annotated large cohorts, and reproducible, explainable research studies that augment existing data [57].

In order to provide individualized therapy recommendations based on lifestyle, genetic, and medical history aspects, AI evaluates patient data. Precision medicine reduces trial and error in therapy by using AI to match patients with the most effective medicines [58]. AI algorithms analyze extensive financial datasets to detect patterns, forecast market behaviors, and execute trades with exceptional speed and precision. Robo-advisors leverage AI to offer customized investment guidance tailored to individual risk preferences and financial objectives. AI strengthens fraud detection mechanisms by pinpointing irregular transactional patterns, thereby lowering false alarms and bolstering security [59]. AI-driven models for risk assessment evaluate creditworthiness and predict loan defaults, leading to more informed lending choices and diminished financial risks [56]. AI-powered computer vision systems inspect products to ensure they meet high-quality standards and reduce manufacturing waste by identifying defects. AI algorithms analyze data from manufacturing processes to enhance product yield and consistency through process optimization. AI also improves inventory management by forecasting demand, predicting supplier lead times, and identifying potential risks in the supply chain [29]. In logistics and transportation, AI-driven systems optimize routes and improve efficiency across distribution networks. AI analyzes sensor data from machinery to predict maintenance requirements, minimizing downtime and maximizing production efficiency. Additionally, AI facilitates collaborative manufacturing by enabling robots to work alongside human workers, thereby boosting productivity and safety. Furthermore, AI algorithms streamline robotic

assembly lines, reducing assembly time and enhancing the precision of product assembly [60].

AI is an inseparable part of present and future. For this purpose this paper aims to study about AI tendency for information sharing. The article also tries to explore the advancements and trends in information technology, particularly AI, as a potential weapon for reassembling the future world.

2. Literature Survey

Information security involves safeguarding computer systems and networks from unauthorized access, theft, damage, or disruption. As organizations increasingly rely on technology for their operations, protecting sensitive data has become crucial. Data breaches in today's digital age can severely impact an organization's reputation, financial stability, and trust with customers [61]. Cybercriminals continuously evolve their tactics, posing challenges for information security professionals who traditionally rely on rule-based systems. These systems, however, struggle to adapt to new threats and the vast data volumes of modern IT environments. Consequently, there is growing interest in using AI to enhance information security outcomes [59].

AI holds promise in revolutionizing information security by swiftly processing large data sets, identifying anomalies, and automating responses to security threats. This technology augments human capabilities, enabling quicker and more effective responses to security incidents [48] [54]. AI's ability to learn and evolve over time through machine learning algorithms is particularly advantageous. These algorithms can be trained with historical data to improve threat detection accuracy and respond promptly to emerging threats. AI also provides real-time insights into security events, enabling continuous monitoring and proactive identification of vulnerabilities [1].

The integration of AI in information security is becoming increasingly vital as organizations seek advanced defenses against cyber threats. AI enhances security by analyzing real-time data to detect unusual activities that may indicate cyberattacks. It can automatically respond to security incidents, such as blocking access to compromised systems or patching vulnerabilities promptly [61] [62]. Overall, AI's capability to process vast amounts of data quickly and automate threat detection and response represents a significant advancement in strengthening information security defenses [63]. Autonomic computing, also known as self-adaptive systems, investigates how systems can autonomously achieve desired behaviors. These systems are often referred to as self-system denotes specific behaviors such as self-configuration, self-optimization, self-protection, and self-healing [1].

Self-configuring systems automatically update missing or outdated components based on alerts from a monitoring system. Self-optimizing systems improve their performance by efficiently managing computational tasks, balancing resource usage, and avoiding overloads or under-utilization [64]. Self-protection

involves defending against cyber-attacks and intrusions, including safeguarding the autonomic coordinator overseeing the system. Self-healing systems detect, assess, and recover from errors independently, enhancing fault tolerance and minimizing disruptions without human intervention [62]. The ultimate goal is for self-managed and self-healing systems to operate without manual configuration or updates. Systems should autonomously control all these behaviors as part of their operation. Different implementations achieve these objectives with varying degrees of effectiveness and human oversight. As part of IBM's Autonomic Computing paradigm, the Autonomic Manager (AM) interacts with the environment through sensors and effectors, executing actions based on data and rules from a knowledge base [46]. Administrators configure the AM using high-level policies and actions. The system continuously monitors quality of service metrics, analyzes data, devises action plans, verifies their effectiveness, and implements changes to maintain application performance.

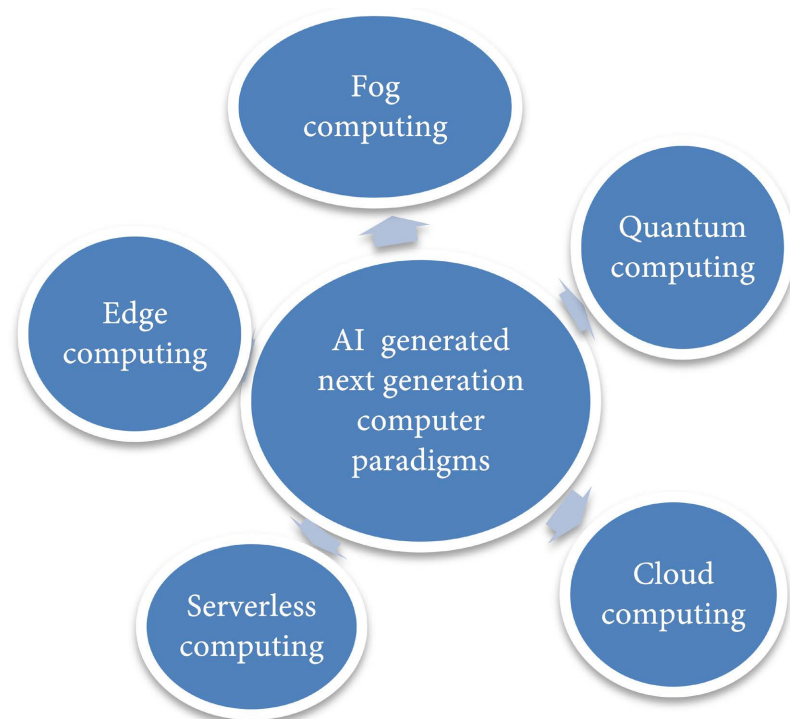


Figure 1. AI generated next generation computing paradigms.

AI is now advancing to autonomously identify and prevent malware and suspicious activities, a capability not feasible a decade ago. **Figure 1** shows generated next generation computing paradigms. Despite these strides, AI in cyber security requires further enhancement. Research into more effective AI training techniques, enabling autonomous threat detection and response, is critical in our technologically evolving era [63]. As organizations increasingly rely on technology, safeguarding sensitive data is paramount against rising cyber threats, which continually evolve in sophistication [46]. AI's potential in cybersecurity extends to

automating tasks such as network traffic analysis, access control, and anomaly detection, tasks traditionally labor-intensive for human specialists. Predictive analytics powered by AI enhances early threat detection, mitigating risks before they escalate. Another promising application is AI's potential to emulate human immune systems, swiftly identifying and neutralizing threats based on learned patterns, akin to biological immune responses [57]. In cybersecurity, AI employs neural networks and expert systems, leveraging deep neural networks for complex threat prediction and expert systems for rule-based problem-solving. While supervised learning effectively identifies known threats, unsupervised learning holds promise in detecting novel threats by analyzing normal system behavior without prior training data. This approach, despite requiring refinement, marks significant progress in cybersecurity research, exemplified by innovations like the Enterprise Immune System [55].

AI's role in shaping smart cities involves optimizing energy usage, transportation systems, waste management, and public safety, thereby enhancing urban living conditions and sustainability. Collaborative efforts among governments, industries, academia, and international organizations are crucial in establishing global AI governance frameworks, standards, and best practices to harness AI's potential for societal benefit [46]. Recently, AI has advanced to autonomously learn and combat malware and suspicious activities, a capability that was not feasible a decade ago. However, there is still considerable room for improvement in AI's cybersecurity capabilities. Research into more sophisticated training techniques and autonomous threat response is essential for enhancing AI's effectiveness in cybersecurity. As technology evolves, the integration of AI becomes increasingly critical in safeguarding valuable data across diverse organizations against the growing sophistication of cyber threats [54]. Many countries are investing significantly in developing AI technologies for cybersecurity and related areas, underscoring the urgency of enhancing AI's role in detecting and mitigating various cyber threats in real-time. AI enhances IoT by processing data from connected devices at the network edge. AI algorithms deployed on IoT devices enable rapid decision-making, reducing delays and improving responsiveness in critical sectors such as smart cities, healthcare, and manufacturing. This synergy empowers organizations to optimize operations and enhance efficiency. AI's impact extends to reshaping the IT workforce, necessitating new skills in AI development, data science, and machine learning engineering. Collaboration between IT professionals and AI systems will drive organizational efficiency and innovation, leveraging AI's capabilities effectively [1].

Furthermore, AI accelerates software development by automating tasks like code generation, debugging, and testing. AI-powered tools aid developers in writing efficient code, enhancing performance and reliability of software applications. In customer interactions, AI-powered systems customize user experiences based on individual preferences and behaviors [29]. This translates into tailored software interfaces, adaptive content delivery, and responsive support through

chatbots and virtual assistants. The integration of AI into information technology signifies a transformative shift, promising heightened automation, advanced analytics, enhanced cybersecurity, and innovative applications across industries [65]. Embracing AI will be crucial for organizations aiming to maintain competitiveness and adaptability in an ever-evolving digital landscape [21]. The future of AI in quantum computing holds enormous promise for pushing computational capabilities beyond current boundaries. Quantum computing can process immense volumes of data simultaneously and execute intricate calculations at unprecedented speeds, significantly enhancing AI algorithms. This includes speeding up machine learning models, refining AI training processes, and solving complex optimization challenges more effectively [58]. Quantum computing has the potential to transform machine learning by enabling the creation of quantum machine learning algorithms. These algorithms could advance capabilities in pattern recognition, data clustering, and predictive modeling beyond the capabilities of classical computers [66]. AI algorithms often demand substantial computational power for tasks like optimization and simulations. Quantum computing's ability to explore multiple scenarios simultaneously (quantum parallelism) and solve optimization problems efficiently (quantum annealing) could greatly enhance AI's performance in these domains.

Quantum computing also promises advancements in cryptography and cybersecurity. AI systems could leverage quantum-resistant cryptographic methods to safeguard sensitive data and communications from future quantum threats, ensuring robust security measures [64]. The potential applications of AI in quantum computing are diverse, spanning industries such as finance (portfolio optimization), logistics (route optimization), healthcare (personalized medicine), and climate modeling (environmental simulations). These applications have the potential to redefine the impact of AI-driven technologies on society and businesses [53]. Neural networks further enhance cybersecurity by clustering and identifying abnormal IP traffic patterns, crucial for anomaly detection and preemptive security measures. As AI continues to evolve, its integration into cybersecurity frameworks becomes increasingly pivotal, addressing diverse cyber threats and bolstering overall system resilience against sophisticated attacks [58].

3. Proposed Methodology

Analogy to accomplish advancement in information technology:

In short, machine learning (ML) is the process of teaching computers anything. Artificial intelligence is what's left over after teaching machines lessons. The primary objective of this paper is to devise a method for evaluating the future landscape of information technology through various AI technologies. It is crucial to ensure thoroughness in order to encompass and review all pertinent advancements in AI, spanning both industry and academia. Initially, we must establish a clear definition of AI technology to ascertain its ability to encompass new inventions and developments across innovation and production sectors. AI is not a singular

technology but a research discipline encompassing diverse subfields that have already produced and will continue to generate a variety of technologies. Rather than merely listing AI-related technologies, which could be biased and fail to represent the full spectrum of AI areas, it is essential to identify and acknowledge the subfields responsible for these technologies. This approach enables us to comprehensively cover AI technologies emerging from academic and industrial research. **Figure 2** describes a flow chat of working Basic analogy of Artificial Intelligence.

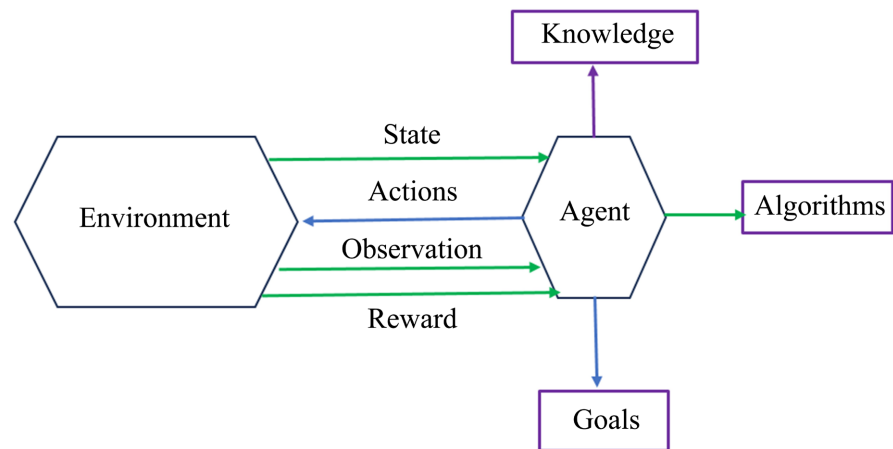


Figure 2. Basic analogy of Artificial Intelligence (AI).

This study proposes a methodology for categorizing and evaluating AI technologies using Technology Readiness Levels (TRL) to determine their maturity and readiness for deployment. The study interprets nine TRLs within the context of AI and classifies different AI categories accordingly. The introduction of a generality dimension allows for a more comprehensive assessment of each technology's capabilities. The analysis reveals that technologies with specific functionalities can achieve higher TRLs, while more general AI capabilities often lag behind. The study presents readiness-versus-generality charts as visual aids, showcasing where different AI technologies stand in terms of their readiness and applicability across different levels of generality. The TRL vs generality chart compares a technology's maturity level with its generality or generalizability. Technologies with high generality are versatile and can solve diverse problems. Technologies with high TRL and generality are highly valued for their broad impact and suitability for widespread adoption. Conversely, those with low TRL and generality are often in experimental stages and may have limited immediate application. The framework applies universally to any technology, but pinpointing its exact position is crucial in the context of artificial intelligence.

Based on the informatics obtained from the analogy of AI, a survey among the previous research within a range of 10 years was done to gather the traces of AI in present and future trends for various information. The research flowchart is summarized in **Figure 3**.

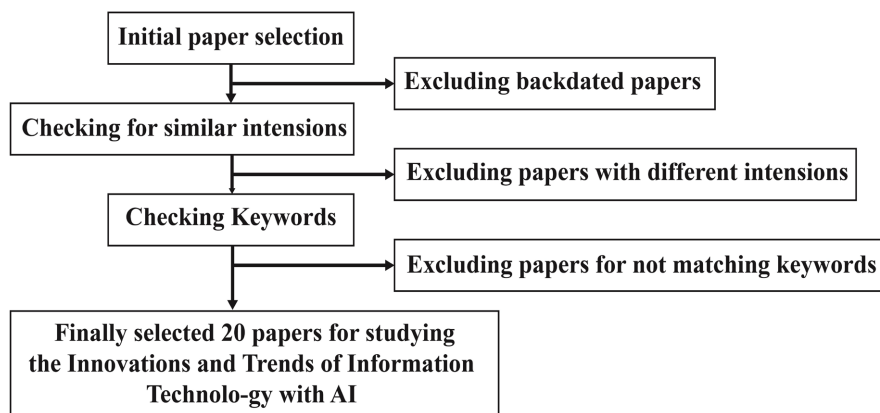


Figure 3. Research flowchart.

4. Results and Discussion

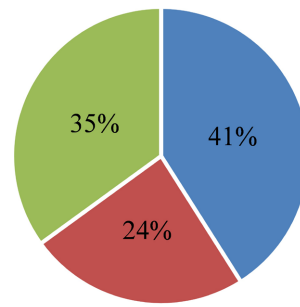
AI is the vision of the future. According to the study to gathering the traces of AI in present and future trends in various information, a handful number of facts have come to light, which are summarized below.

AI offers a significant advantage in information security by efficiently handling vast amounts of data. As organizations accumulate increasingly large datasets, the task of effectively analyzing and monitoring this information becomes more daunting. AI algorithms excel in this realm, capable of swiftly processing extensive data volumes in real-time. They excel at pinpointing anomalies and detecting unusual activities that could signify a security breach. For instance, AI algorithms scrutinize network traffic to spot irregular behavioral patterns indicative of cyberattacks. They also examine system logs to uncover signs of unauthorized access or unusual activities.

Real-time data analysis by AI provides organizations with early warnings of potential security incidents, enabling prompt and decisive responses. Furthermore, AI aids in aggregating data from diverse sources to uncover patterns and trends in security incidents. This capability empowers organizations to implement robust security measures and preemptively address vulnerabilities before they are exploited by malicious actors. Overall, AI's ability to swiftly process extensive datasets represents a crucial advantage in bolstering information security. By furnishing real-time insights and identifying potential threats, AI equips organizations to proactively defend against evolving cyber threats and safeguard their critical data and systems.

4.1. Positive Impacts of AI

In SDGs (Sustainable Development Goals), the percentages occupied by AI technology in overwhelming collaboration with information technology is depicted here for the convenience of understanding the innovative AI technology and its upcoming future trends as per expectations.



■ Environment ■ Economy ■ Society

Figure 4. Graphical representation of positive impacts of AI in different areas of SDGs.

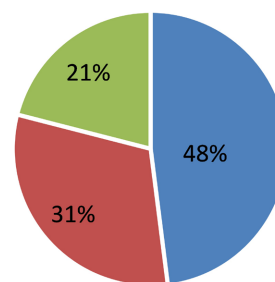
Table 1. Positive impacts of AI in different areas of SDGs.

Area	Percentage
Environment	91%
Economy	65%
Society	85%

Figure 4 is a graphical representation of **Table 1**. On the other hand, in the negative percentages in case of impacts in the environmental, social and economic SDGs, lower percentage is observed which reflects the longevity of artificial intelligence.

4.2. Negative Impacts of AI

It is a discrete metric that cannot be directly optimised. Accuracy is a measure of how frequently a deep learning model predicts the outcome accurately. It can be computed by dividing the total number of guesses by the number of correct forecasts. Accuracy is a metric that can be used to characterise the model’s performance in all classes, which is useful when all classes are equally important. More numbers indicate greater model performance. **Figure 5** is the graphical presentation of **Table 2**.



■ Environment ■ Economy ■ Society

Figure 5. Graphical representation of positive impacts of AI in different areas.

Table 2. Negative impacts of AI in different areas of SDGs.

Area	Percentage
Environment	27%
Economy	21%
Society	39%

Artificial Intelligence (AI) has the potential to profoundly impact our lives, yet fundamental questions remain unanswered about the extent, scope, and timeline of this anticipated transformation. Current tools are insufficient to predict the future achievements of AI or fully comprehend the capabilities of existing AI technologies. Many advancements in AI, often highlighted in influential research papers or impressive performance on specific benchmarks, do not immediately translate into practical applications suitable for real-world use.

In AI, many technologies prioritize performance within specific niche applications over general applicability to achieve readiness in a narrow scope. Only when a technology reaches the top-right corner of this plot does it become truly transformative. For instance, while a robotic vacuum cleaner may achieve TRL 9 by effectively cleaning floors, it does not significantly transform society. However, a fully developed robotic system with advanced capabilities could revolutionize millions of jobs and impact how households manage cleaning, recycling, and even interior design. The shape of these charts can reveal valuable insights. A steep, declining curve that reaches high TRL levels for limited capabilities may indicate a need for fundamental research to develop new AI technologies capable of achieving higher levels of capability. Conversely, a flatter curve that reaches moderate TRL levels across a broad range of capabilities may suggest that achieving commercial viability or widespread use depends more on factors like safety, usability, or public perception rather than rethinking the technology's foundations. However, each case requires individual assessment.

Before conducting this analysis, it's essential to establish criteria for determining the x-axis and precisely locating each point on the chart. Unfortunately, there is no standardized scale for these layers that applies universally to all technologies. Instead, generality layers are defined based on the historical evolution of each technology. For example, some layers, like word recognition for limited vocabularies, may not gain traction, while others, such as speech recognition for broader vocabularies, serve as early milestones in the technology's development. In defining these layers, various dimensions are considered.

Task generality assesses how many different situations or problems the technology can address, while robustness generality evaluates the diversity of conditions under which the technology can perform effectively (e.g., varying quality of information or environmental noise). Existing scales and standards from past applications of specific technologies, such as machine translation and self-driving cars, often inform these assessments. In IT, the AI development areas are depicted

in **Figure 6**.

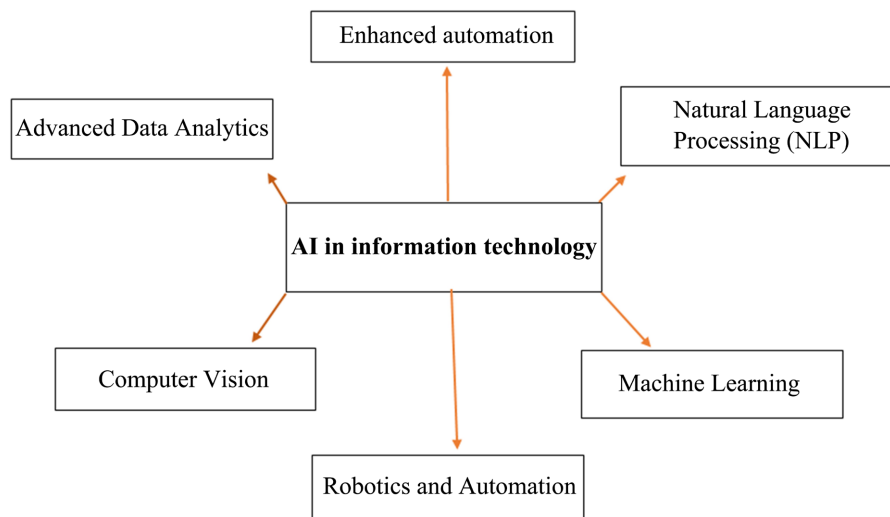


Figure 6. AI revolution in information technology.

4.3. Readiness Level for Different Technologies with AI

AI is changing the act of driving itself: automated technologies already assist drivers and help prevent accidents. As vehicle automation is progressively reaching new levels, these technologies are becoming one of the greatest forces transforming modern transportation systems.

For a vehicle to be autonomous, it needs particular underlying AI capabilities.

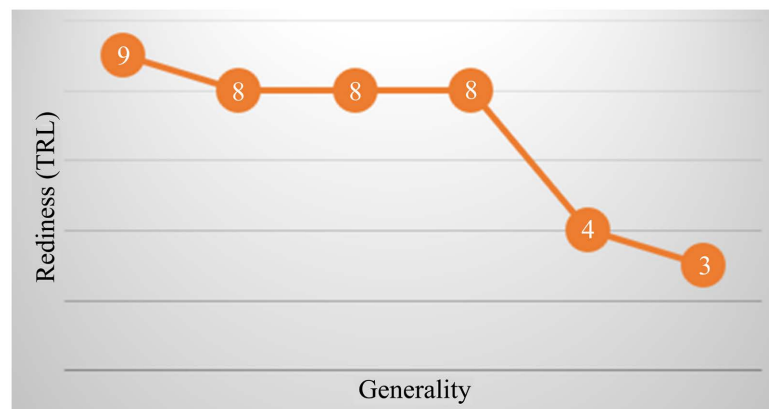


Figure 7. Technology readiness level (TRL) for self-driving car.

The readiness-versus-generality chart for self-driving car technology shows that many cars on our roads have achieved TRL 9 in the stages of no automation levels 0 and 2 of automation (**Figure 7**). Automotive companies are currently engaged in research, prototyping, and testing for conditional and high automation, placing these technologies at TRLs ranging from 4 to 8.

However, fully self-driving cars that operate without any human attention are still at very early TRL stages. Text recognition involves automatically identifying

characters or symbols from images, converting them into a computer-readable format for text processing programs. This process encompasses both offline recognition, which deals with scanned images and documents, and online recognition, where input comes in real-time from devices like tablets and smartphones. Here, our focus is on offline recognition. **Figure 8** represents the Technology readiness level (TRL) for detection of speech.

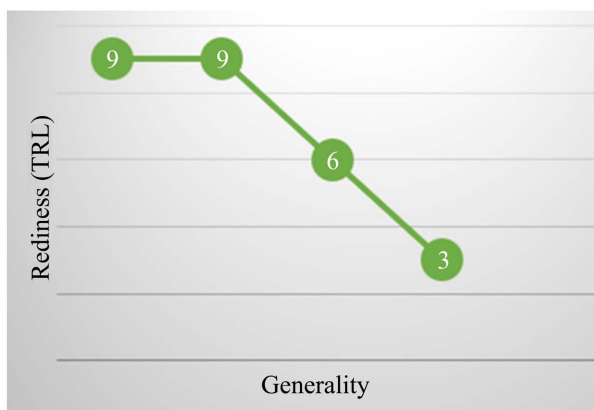


Figure 8. Technology readiness level (TRL) for detection of speech.

However, fully self-driving cars that operate without any human attention are still at very early TRL stages. Text recognition involves automatically identifying characters or symbols from images, converting them into a computer-readable format for text processing programs. This process encompasses both offline recognition, which deals with scanned images and documents, and online recognition, where input comes in real-time from devices like tablets and smartphones. Here, our focus is on offline recognition.

There is a vast amount of textual information, whether written, typographical, or handwritten, generated across various media continuously. Automating the conversion (or reconversion) of this information into a symbolic format represents a significant saving in human resources and boosts productivity. This automation can potentially enhance service quality as well. Optical character recognition (OCR) has been in use since the 1990s, initially driven by the widespread adoption of fax machines by the end of the 20th century. While OCR technologies are already widely employed today, their capabilities and requirements have evolved alongside the shift towards a more digital society.

The digital transformation and the adoption of AI technologies have revolutionized how many key challenges in the IT industry are addressed and simplified. AI is now central to operations across all industries, playing a crucial role in information technology and its applications. By integrating artificial intelligence into human work processes, the IT industry has seen improvements in efficiency, productivity, and overall quality. Tasks that once required extensive support from computer engineers are now achievable thanks to advanced AI algorithms. Concerns often arise regarding the potential impact of fully intelligent AI on the

workforce, with fears that it could render many jobs redundant and lead to a decline in overall employment. While it's true that some tasks, particularly those involving analysis of large datasets, may be more efficiently handled by AI, historical precedent shows that technological advancements have typically led to the creation of new job opportunities. Automation in industries like manufacturing and the internet has reshaped job roles, often in unforeseen ways, where humans and machines collaborate or perform tasks differently.

The development of super-intelligent AI has the potential to outperform human capabilities in certain activities due to its ability to operate continuously without the need for regular breaks. However, it's essential to recognize that technological progress has historically resulted in job displacement but also in the creation of entirely new industries and professions. AI's current trajectory parallels earlier advancements like the personal computer era, contributing to the emergence of numerous new occupations and fields. Despite AI's capabilities, it remains far from achieving human-level intelligence and emotional understanding. Therefore, AI should be viewed as a complement rather than a replacement for roles traditionally performed by IT departments. While technologies like self-driving vehicles raise concerns about job security in sectors like trucking, human drivers are still considered superior in handling unexpected situations such as severe weather or traffic congestion. Ultimately, instead of solely focusing on maximizing business efficiency through technology, organizations should prioritize addressing workforce development challenges to ensure sustainable business success. This approach acknowledges the ongoing evolution of technology and the importance of human expertise in shaping its effective implementation and utilization within the IT landscape.

4.4. Challenges of AI Technology

However, nothing is worthy or gained without thrones. Technologies are full of challenges and ups and downs in their trends. AI in information technology introduces numerous ethical, social, and regulatory complexities that demand careful examination. Biases ingrained in AI systems from their training data can lead to unjust outcomes in critical areas such as employment, finance, and law enforcement. Moreover, the extensive data requirements of AI raise concerns about the collection, storage, and usage of personal information. Ensuring transparency in how AI arrives at decisions is essential for maintaining accountability and fostering trust.

The automation driven by AI also poses challenges, potentially displacing jobs and necessitating workforce reskilling. Furthermore, unequal access to AI technologies could exacerbate disparities between different socioeconomic groups and nations. Additionally, AI's capability to manipulate public opinion through sophisticated misinformation campaigns highlights significant societal risks. On the regulatory front, there is a pressing need for cohesive frameworks to oversee the ethical development and deployment of AI. Given AI's global reach, international

cooperation is crucial to harmonize regulations and avoid conflicting laws. However, enforcing these regulations is complicated by AI's rapid evolution and its intricate technological landscape.

Addressing these multifaceted challenges requires collaborative efforts involving governments, technology developers, ethicists, and civil society. Effective regulation should strike a balance between fostering innovation and safeguarding ethical standards to harness the potential benefits of AI while minimizing its associated risks.

5. Conclusion

Artificial Intelligence (AI) is rapidly gaining traction in the Information Technology (IT) sector and shows no signs of slowing down. As AI advances in capabilities, it drives innovations that revolutionize global business operations for the better. The recent surge in electronic and information technologies has led to the development of smarter, more sophisticated, and efficient machines. AI lies at the core of these advancements in IT. Traditionally, futuristic visions centered on technologies like rockets and spacecraft as symbols of future progress. However, these were inventions of the Industrial Age, emphasizing sheer power and force. In contrast, today's technological prowess lies in mobility, intelligence, communication, and complexity. These attributes enable machines to integrate into nearly every facet of human activity, enhancing storage, coordination, and operational speed. This evolution is reshaping how we connect, work, learn, entertain, and even form relationships. In actual word, the future direction of AI in information technology holds promise for profound transformation and widespread impact across industries and society. As AI advances, it will revolutionize automation, streamline decision-making, and drive innovation and efficiency to new heights. Yet, this path forward presents challenges such as ethical dilemmas, adapting the workforce, and establishing effective regulatory frameworks. Addressing these challenges proactively and fostering collaboration among stakeholders is crucial to fully harnessing AI's potential to create a future where technology serves humanity responsibly and inclusively. Moving ahead, ongoing research, continuous innovation, and a steadfast commitment to ethical standards will be pivotal in shaping a future where AI in information technology contributes positively to our communities and enhances our quality of life as well.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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