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ARTIFICIAL INTELLIGENCE IN INFORMATION TECHNOLOGY

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ABSTRACT
Artificial Intelligence is a broad field that encompasses various concepts in Information Technology. This research paper focuses on different technologies in AI and how they apply to improve the performance of multiple sectors. The purpose of this study is to discuss Artificial Intelligence and its present and future applications. AI is the foundation of multiple concepts, such as computing, software creation, and data transmission. The technologies that use AI are machine learning, deep learning, Natural Language Generation, speech recognition, robotics, and biometric identification. AI applies to many sectors such as healthcare sectors, assembling and manufacturing industries, business organizations, and in the automotive industries. AI also has various advantages that make it gain more popularity in many areas. The AI-powered machine can perform many jobs at once; they are not costly compared to human beings and are accurate and efficient. AI also encounters multiple problems that undermine its application. AI is prone to technical difficulties, security snags, data difficulties, and can cause accidents if users fail to understand the AI system. The increased use of AI has transformed various sectors by boosting the organization's performance and facilitating data safety.

KEYWORDS: Artificial Intelligence, Machine Learning, Speech Recognition and Biometrics.

INTRODUCTION
The digital world is becoming more complex annually. Scientists and researchers have come up with innovations in the field of technology. A significant breakthrough in digital technology is Artificial Intelligence (AI). Artificial Intelligence is a keyword that defines various concepts in Information Technology, such as computing, software creation, and data transmissions. Nonetheless, Artificial Intelligence has come at a time where cyberattacks are on the rise. Many corporates and business enterprises today apply Artificial Intelligence to provide security to their data and information systems. When people think of Artificial Intelligence, they think of cybersecurity and cyberattacks issues (Dilek et al. 2015). Artificial Intelligence also defines various concepts within the field of computer science. Artificial Intelligence aims at creating machines that can think and work like the human brain. Engineers are currently creating robots that help in the manufacturing, assembling, and commercial industries. The robots provide information and work by assembling products using the concept of Artificial Intelligence. The idea of programming also has a significant application in Artificial Intelligence since these machines use computer programs to deliver information and perform different actions. Artificial Intelligence is becoming more complex as years pass. Apart from the many advantages, AI also has disadvantages that might affect the world's population in the future. It will be of significance to address how AI has become useful to the human community, its problems, and how itspopularity will affect the future human society.

LITERATURE REVIEW
The United States of America is one of the nations that apply Artificial Intelligence in many technology and business sectors. With President Trump's election, the U.S has invested massive funds to develop AI in many areas, such as the military, which are essential to the nation. Srivastava (2020) opines that the U.S government invests in AI since it is crucial in maintaining the economy and national security to protect the lives and citizens of the U.S. Not to forget, the government promotes Federal Investment in Artificial Intelligence collaborating different industries, academic institutions, and other non-federal agencies to innovate and develop various sectors by using Artificial Intelligence (Srivastava, 2020). The government of the U.S believes that Artificial Intelligence will be of great importance in facilitating good governance and global leadership in terms of global military supremacy and technology. Through AI, the United States will build partnerships with other global powers in the field of technology and strengthen its military force.

Artificial Intelligence is a foundation of many concepts in the field of computer science and technology. These concepts are machine learning, deep learning, robotics, computer vision, internet, recommender systems, and natural language processing (Ashley, 2017; Jackson, 2019). These concepts apply widely in the science and technology field as they work using computer programs. Artificial Intelligence is efficient since most of them do not rely on human assistance. Machine learning is a concept derived from Artificial Intelligence, and it relies on data and patterns that the system uses to make decisions (Alpaydin, 2020). Robotics is also a concept derived from Artificial Intelligence, and it entails designing and construction of intelligent machines that perform human jobs (Patil, 2016; Dirican, 2015). Engineers are currently using robotics and Artificial Intelligence to make future self-driven vehicles (Makridakis, 2017) that will use commands from humans and prevent cases of accidents.

Artificial Intelligence plays a vital role in cybersecurity. In modern times, the internet is full of rogue users who practice illegal activities within the web. Computer hacking and loss of data are some of the cyberattacks issues that people complain about annually (Dilek et al. 2015). The introduction of Artificial Intelligence plays a critical role in ensuring that hackers and scammers do not access confidential information from cloud data storage systems ("Advantages of Artificial Intelligence"). The world has embraced the use of Artificial Intelligence as it provides more advantages than disadvantages that benefit individuals and corporates. In future years, AI intelligence will be everywhere. As seen today, traveling and businesses apply AI to make their operations a success. Some years later, companies will deliver goods using robots, and people will also purchase robots to do many house chores (Makridakis, 2017). AI will also lead to the loss of human labor since robots will be able to do different activities done today by humans. Artificial Intelligence is a brilliant strategy for the technological world; thus, man must prepare to survive in the coming years when AI will be accessible in various sectors.

Artificial Intelligence involves various tools and technologies used widely in the technological world. These technologies include:

MACHINE LEARNING

Machine learning is an application that uses AI and allows system automation (Alpaydin, 2020; Marsland, 2015). Machine learning focuses on computer data programs to access and analyze the data. Machine learning will enable computers to learn various things automatically without human assistance (Acemoglu & Restrepo, 2018). Machine learning uses computer algorithms, which enables the computer to learn from examples and experiences. Machine learning algorithms occur in two categories, namely supervised and unsupervised algorithms (Marsland, 2015). Supervised machine learning algorithms apply to basics learned previously to new data by the use of examples that allow the machine to predict the future. The machine undergoes the training of datasets, and the algorithm produces an inferred function to predict output values (Marsland, 2015). After training, the system provides new input. The learning output can perform a comparison between the correct and the intended output to modify the model in case there are errors.

Unsupervised machine learning algorithms applies in the case where the information used in training is not classified. Unsupervised learning can study how the system functions to give an account of a hidden structure from an unlabeled data system (Marsland, 2015). Unsupervised machine learning can provide inferences among datasets to explain on describe invisible structures from unclassified data. In contrast, the semi-supervised machine learning algorithm happens to be between supervised and unsupervised machine learning since they employ labeled and unlabeled data when training datasets. Semi-supervised machine learning can improve learning accuracy, making it suitable for training tagged data since it provides adequate skill and is a relevant resource (Marsland, 2015). The reinforcement machine learning algorithm works by environmental interaction to produce actions and discover errors within its vicinity. Reinforcement learning helps improves the performance of machines and software by automatically determining specific behaviors (Acemoglu & Restrepo, 2018). Machine learning enables computers to analyze massive datasets to deliver accurate and faster results. It also allows computers to identify risks that lie within its data systems (Marsland, 2015). A combination of machine learning with AI can make the computer process massive volumes of data, which is the right approach for organizations and computer users.

DEEP LEARNING

Deep learning is a function of Artificial Intelligence that copy's how the human brain works in processing data and pattern creation that are vital in making strategic decisions. Deep learning is also known as a deep neural network since it has systems capable of learning unsupervised data from unstructured data (Hargrave, 2019). Deep knowledge helps to gain massive amounts of unstructured data that makes it strenuous for humans to process and understand (Hargrave, 2019). Deep learning uses a hierarchical level of artificial neural networks that makes the system undergo the process of machine learning (Hargrave, 2019). In general, deep learning artificial intelligence learns from unstructured and unlabeled data. Deep learning AI is vital to an organization since it helps prevent fraud or money laundering.

NATURAL LANGUAGE GENERATION (NLG)

Natural Language Generation (NLG) is a function of Artificial Intelligence that generates written or spoken narrative from datasets (Horacek, 2015). NLG relates to other AI functions like natural language processing (NLP), computational linguistics, and natural language understanding (NLU). These functions work by machine to human interaction and vice versa. Horacek (2015) opines that NLG can mine numerical data, perform pattern identification, and share information for human understanding. The internet can produce news and other stories due to the speed of the NLG software.

SPEECH RECOGNITION

The current trend in technology is speech recognition, which many industries have developed to help them in their daily operations. Speech recognition is a technology that recognizes speech and converts it into readable information or text (Jesus, 2019). Many corporates such as Amazon, Microsoft, Google, and Facebook are using the feature of speech recognition in various platforms like Siri, Google Home, and Amazon Echo to promote service delivery to online users (Jesus, 2019). Most technology companies are looking forward to using speech recognition technologies to improve the standards of their services and products since it is efficient and easy to use. From conducted research by Jesus (2019), about 66.6 million Americans had begun using speech recognition technology. Nonetheless, by 2018 people had started using virtual assistants that were efficient in speech recognition (Jesus, 2019). However, artificial intelligence teams need to focus on significant challenges such as accents and background noise to improve the speech recognition experience.

Voice recognition technology is gaining popularity annually. Researchers predict that by 2023 the technology will be worth 18 billion dollars (Jesus, 2019) since it will be widely applicable in phones, refrigerators, automobiles, and other vital devices. Currently, technology companies have focused on two forms of speech recognition technologies, namely Smart Speaker and Smart Home and Mobile Device Applications (Jesus, 2019). The Smart Speaker and Smart Home applications are Amazon's Echo and Alexa that use voice-powered virtual assistant and Amazon web services to recognize voices for business operations. Google Home and assistant is a voice-activated virtual assistant application of the google company that facilitates sending and requesting payments through google pay (Jesus, 2019). Cortana application is a voice-activated virtual assistant released in 2017 by Microsoft (Jesus, 2019) to help online users to receive user reminders, store notes, and lists and manage various applications such as calendars within the computer. For mobile apps, there is Siri, which is a virtual assistant application created by Apple company to help users in various online activities such as playing songs and transferring funds to different accounts (Jesus, 2019). Currently, Facebook is working to enroll its speech recognition software to help online users perform their online activities with ease.

BIOMETRICS

The digital age has become too complicated to the extent that security is a priority for data systems in many organizations. The introduction of Biometric identification has been a breakthrough in improving the safety of data systems. Biometric technology uses body traits such as facial recognition, iris scan, fingerprint scan, among other morphological characteristics that the AI system can easily understand (Akhtar et al. 2017; Efron, 2019). The AI can transform these visible traits into specific codes that the operation can easily comprehend to perform its work. Biometric ID validation occurs in many ways like fingertip recognition,

iris recognition, face and voice recognition, and DNA matching (Efron, 2019). In general, Artificial Intelligence supports Biometric systems to perform these validations. Biometric validation is today used in a wide variety of devices. Many smartphones and computers currently support fingerprint scanners and face recognition due to Artificial Intelligence (Akhtar et al. 2017). Biometric identification is of considerable significance as it provides top security to data systems and digital devices.

APPLICATION AND TYPES OF ARTIFICIAL INTELLIGENCE

The concept of Artificial Intelligence began back in 1956 from an American computer scientist known as John McCarthy (Jackson, 2019). Today, computers offer automatic processes in various sectors in business and technology. It continues to transform the world in all industries 60 years after its introduction. Artificial Intelligence in machines and computer systems imitates intelligent human processes (Jackson, 2019). These creative social processes include self-corrections, reasoning, and learning. Its ability to simulate human Intelligence makes it suitable for various applications.

TYPES OF AI

According to computer scientists and software engineers, there are four types of AI. The first type of AI is reactive machines (Jackson, 2019). An example of a responsive device is Deep Blue, which is an IBM chess program. The Deep Blue Machine works by identifying and making predictions of the pieces on the chessboard. It is capable of analyzing its moves and the opponent's moves (Maridakis, 2017). The machine is not useful since it lacks memory that makes it unable to recall past experiences. The second type of AI is limited memory machines. Finite memory machines can recall past experiences and use them to make future decisions (Jackson, 2019). Vehicle engineers today use the concept of limited memory to make automatic vehicles that make them respond to specific commands. Thirdly, there are Artificial Intelligence systems that use the idea of self-awareness to perform different activities (Jackson, 2019). Machines using the idea of self-awareness can understand the events within their current environment. Lastly, some Artificial Intelligence systems apply the concept of "Theory of Mind" (Jackson, 2019). Such systems can understand how the beliefs and intentions can affect the decisions they make. Artificial Intelligence aims at providing machines with human Intelligence, which enables them to perform many operations as the modern man does.

APPLICATIONS

Artificial Intelligence applies to a different sector in the modern world. Its apps have transformed most areas resulting in quality work and faster means of business operations. Firstly, Artificial Intelligence has an important use in the healthcare system. Engineers have designed machine learning systems which help medical practitioners to diagnose health issues (Admin, 2017). The advantage of machine learning is its ability to work at a faster rate compared to humans. An example of a technology, in this case, is IBM's Watson. The machine can comprehend natural language and reply to asked questions (Admin, 2017). Besides, Szolovits (2019) suggests that the device can perform data mining to extract patients' data, thus helping in the hypothesis. Therefore, Artificial Intelligence has a wide range of uses in the healthcare sector. AI can help medical practitioners in the examination, representation, and cataloging of medical information about patients (Admin, 2017). The healthcare sectors benefit from AI since it helps in decision making and in performing further research. AI can integrate different activities in medical and cognitive sciences (Admin, 2017). AI also provides rich content for future scientific medical disciplines (Szolovits, 2019). The healthcare sector highly benefits from the applications of AI; thus, medical practitioners can efficiently attend to patients and perform other medical operations.

Secondly, Artificial Intelligence has a full application in business. Businesses use AI in transferring and cross-referencing data. Managers use AI to update different files that are important for the organization. Moving and cross-referencing of data strengthens the chain of communication between various departments (Ashley, 2017; Dirican, 2015), thus facilitating most of the organizational activities. Policymakers also use AI applications in analyzing consumer behavior and product recommendations (Dirican, 2015). Consumers are major stakeholders of many business organizations; thus, AI helps in consumer behavior forecasting to help internal stakeholders like managers to understand consumers and the products they recommend.

Business organizations also have a case of fraud and theft that tend to undermine business operations. Organizations benefit from Artificial Intelligence since it helps in detecting fraud (Singh & Singh, 2015). AI is efficient in data analysis, making it easier to detect possible fraud within the data and information systems (Dirican, 2015). Today, organizations have various strategies for marketing. One crucial strategy used by companies in marketing is advertising their products and brands. Therefore, AI application helps companies to perform personalized advertising and marketing messaging (Dirican, 2015). Through advertisements and messaging, organizations can communicate and attract more consumers, thereby improving their business. AI applications are also critical in customer service (Dirican, 2015). Business organizations can communicate with customers via telephone, helping them to know how they can improve their services to consumers. Thirdly, AI technology has a wide range of applications in modern education. Computer devices use machine learning concepts that help students to understand academic content. AI helps students to get an education at any time (Kuprenko, 2020). For instance, students highly benefit from AI applications during this time of the pandemic. Students can study at home using their computers, smartphones, and tablets. AI enables students to engage with their teachers and professors from where they are, thus facilitating education. Artificial Intelligence helps students get a variety of educational options based on their needs (Kuprenko, 2020). Students can access learning materials by using AI, enabling them to learn from anywhere. Students can choose a variety of topics to learn about, thus helping them in their areas of weakness (Kuprenko, 2020). AI provides students with revision materials since students can go through various tests, and the AI system analyzes them and gives correct answers. Kuprenko (2020) opines that virtual mentors can monitor the progress of students by using AI-based platforms. Currently, teachers and professors use virtual mentors to provide information concerning the development of their students. AI technology, such as Coursera platforms, allows academic providers to identify weaknesses among their students (Kuprenko, 2020). The Coursera platform works in a way that it can notify the teacher if students chose incorrect answers on a specific question. AI systems also allow for better engagement between students and teachers. AI-based algorithms can provide personalized recommendations and training programs through the analysis of the user's knowledge and interest (Kuprenko, 2020; Marsland, 2015). Teachers and professors also spend less time searching for educational materials for students since AI provides an automated curriculum platform. AI technology allows students and academic institutions to find competent teachers that can improve academics (Kuprenko, 2020). Artificial Intelligence technology has developed various educational institutions enabling students to improve on their academic performance by using necessary academic resources.

Fourthly, the automotive industry is becoming a growing industry because of Artificial Intelligence. Car manufacturers both in the U.S and Europe have been on the timeline towards developing vehicles using machine learning. Car manufacturers such as Tesla predict that our highways will have self-driven cars that use AI technology. This will be a brilliant strategy in curbing road accidents that happen due to human errors. Automotive companies such as Autox and Nutonomy located in California and Massachusetts, respectively combine AI software, sensors, and real-time cameras to manufacture self-driven vehicles that would provide safety in our highways (Schroer, 2019). The AI vehicles will not only be autonomous but will also be able to communicate with drivers and pedestrians within the surrounding. Through AI, cars will be able to limit their speeds and reduce cases of accidents on roads. Optimus Ride company located in Massachusetts uses Artificial Intelligence to produce future electric and self-driven automatic vehicles that will be efficient, consume less parking space, reduce the number of cars on the road, and be environmentally friendly (Schroer, 2019). Today vehicles are major pollutants of the atmosphere; hence the introduction of AI automotive will decrease the environmental pollution. Waymo automobile company located in California also uses Google principles to create self- driving vehicles that will transport people to different regions. However, the DataRPM company located in Massachusetts has come up with a new feature that currently applies in cars to assist drivers. The AI-powered advanced driver-assistance system (ADAS) in vehicles helps in automatic braking, driver drowsiness detection, and detection of lanes that allows drivers and reduces accidents (Schroer, 2019). Artificial Intelligence is an eye-opener to vehicle manufacturers allowing them to design good vehicles of the future. In general, AI automotive will be self-driving, electric, and will be environmentally friendly, which indicates how bright the future will look.

Robotics has been a mind-blowing concept in Artificial Intelligence. Engineers have made robots to perform

human intelligence functions by using AI systems in them. Company's today use robotics for various operations because they are efficient compared to human beings. AI has transformed robotic solutions by bringing in flexibility and learning capabilities that allow robots to perform multiple services as if they are living creatures (Patil, 2016). AI is significant in robotic assembly applications. Assembling industries such as vehicle assembling use robotics to collect different parts of vehicles and machines, which is efficient and fast (Carrasco, 2019). Robotics applications are also vital in packaging. Industries today use AI-based robot machines that are faster and accurate in packaging. A considerable percentage of packaging industries today use robot packaging since they work faster, accurately, and are of low cost compared to human labor. Robotics is also useful in providing customer service since it has programs that process natural language (Carter & Nielsen, 2017; Carrasco, 2019). This feature makes them easily interact with customers, thus delivering quality service to the company. Other robots can perform manual jobs when commanded. Users can teach open source robots on how to perform general tasks such as house chores and small-scale agriculture (Carter & Nielsen, 2017), thus saving time and improving the quality of work done.

ADVANTAGES OF ARTIFICIAL INTELLIGENCE

Artificial Intelligence has a wide range of benefits that has increased its popularity and applications in many business sectors. Artificial Intelligence is advantageous since it is often readily available for use. For instance, machines powered by AI have higher performance than human beings, thus delivering quality work within a short period (Carrasco, 2019). Artificial Intelligence offers daily applications in many ways. Smartphones and computers use AI applications, which is a necessity for many people since people need to communicate and store their data in AI-powered devices (Ashley, 2017). Smartphone and computer users also use AI technologies such as speech recognition to help in various daily operations. Artificial Intelligence also provides digital assistance in many ways. People can use AI-powered computers and smartphones to seek information from the internet ("Advantages of AI"). Organizations use AI systems to provide support to their consumers through customer services. Digital assistants help to reduce the workload for human resource entities within the organization (Carter & Nielsen, 2017). AI- powered machines are capable of handling numerous jobs at a single time, which makes them more efficient than humans. AI machines can act faster than humans hence making them skilled at multitasking to give brilliant results (Carrasco, 2019). AI is also advantageous in reducing errors due to its accuracy at performing various tasks (Amodei et al. 2016). AI has been successful in critical scenarios, such as in diagnosis yielding zero errors (Alpaydin, 2020). The wide range of advantages makes AI machines applicable in most industries in today's world. A.I. has enabled statistics and analysis to redefine the way games are strategized and implemented on the pitch (Nadikattu, 2020).

RISKS OF ARTIFICIAL INTELLIGENCE

Despite its full applications and advantages, AI also has its risks that bring a negative impact on its full applications. Artificial intelligence experiences many data difficulties that tend to affect its applications. Data difficulties in AI occur due to the increase in unstructured data, usually from various sources such as social media and mobile devices (Samandari et al. 2019). AI also experiences technological troubles that may hinder its performance in the system (Samandari et al. 2019). Technical difficulties can be a nuisance as they may fail to reveal important information that the organization highly needs. AI also experiences security snags that are threats to online users. Security snags happen in many ways like fraud, loss of data, scamming, and hacking (Singh & Singh, 2019). Such illegal activities can cause damage to its cloud data systems and the theft of confidential data. Artificial Intelligence may also have misbehaving models that affect the delivery of information (Samandari et al. 2019). Misbehaving models may deliver biased results and become unstable, which affects the efficiency of service delivery in AI systems. AI systems also tend to experience interaction issues between humans and AI-driven machines, which can cause accidents and injuries (Samandari et al. 2019). These vices occur when operations fail to understand how these machines work. For instance, if the user operates the machine slowly, it may begin to behave abnormally, causing accidents and injuries (Samandari et al. 2019; Amodei et al. 2016). Such risks are some issues that policymakers require to consider and learn how they can avoid them to improve the performance of the machines.

SIGNIFICANCE OF THE RESEARCH

The United States is a developed nation, which means that Artificial Intelligence can apply widely in our social, political, and economic activities. My research addresses various concepts of Artificial Intelligence that are universally applicable in our society. From my research, I wish to educate the American people on what AI is and how it can be beneficial to most sectors of the community and economy. Most people use various digital devices, yet they do not understand what they are and how they function. My research can be beneficial to Americans since it can act as a learning material in which people can realize how AI works in most sectors. My research will help the United States to learn the different forms of AI technologies and how they can use them to improve service delivery to its customers. Technologies such as robotics and speech recognition can play a huge role in businesses. The United States can learn how to use machine learning to control their computers and store data safely. Issues of cyberattacks are on the rise, which affects not only individual people but also business organizations. Through my research, these groups can understand how to avoid crimes such as fraud, scams, and hacking. People can learn the importance of biometric identification to safeguard relevant online platforms and databases. My research expounds on many things that we mostly use daily in terms of digital technology. Lastly, America will learn that Artificial Intelligence will lead to loss of jobs for humans in the future since robots will perform similar duties in an accurate, efficient, and short-duration manner compared to human beings. In general, my research aims at providing our American people with basic knowledge about Artificial Intelligence.

CONCLUSION

Artificial Intelligence has massively transformed the human population in terms of technology, leading to the rise of new devices and tools that are hugely important in doing business, education, and communication. The techniques that are functional in AI include machine learning, deep learning, biometrics identification, speech recognition, and Natural Language Generation (NLG). All these technologies apply in one way to improve human interaction with machines to facilitate most operations. For instance, biometric identification uses many devices to enhance the security of data. Machine learning refers to computers to aid various computer processes. Speech recognition applies to online activities such as listening to songs and looking for information on the internet. The types of AI technology machines include relative machines, memory machines, self-awareness machines, and machines using the Theory of Mind, a psychology concept. All these machines work in different ways to boost human experience in the world of technology. AI has gained popularity because of its many advantages, such as its availability and ease of use in many devices. It offers a wide range of activities such as digital assistance, medical applications, and correction of errors by increasing when it performs a job. However, policymakers should also be aware of its demerits, including data difficulties, technological troubles, and security snags that may interfere with its performance. My research aims to educate the American people on Artificial Intelligence and how it can benefit the community. AI is gaining popularity with new inventions coming up annually. Therefore, policymakers should consider using AI-powered technologies in their organizations to help in most company operations that are important.

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