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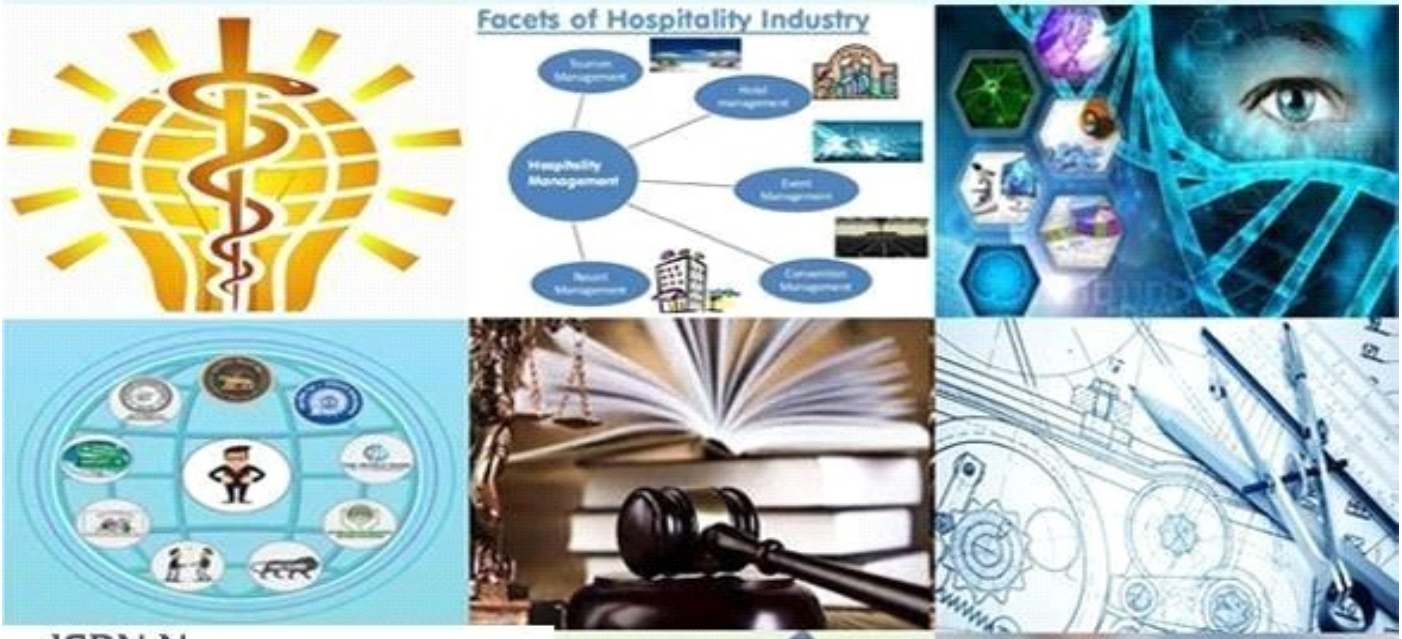

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Vishwabhushan Foundation was started with the objective of creating and delivering high impact and focussed programs to the underprivileged sections of the society in the areas of healthcare, education and socio-economic development.

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A Research Paper on Deep Residual Learning for Image Recognition

ABSTRACT

It is harder to train deeper neural networks. We present a residual learning framework to make it easier to train networks that are much deeper than those that have been used before. We explicitly reformulate the layers as learning residual functions with reference to the inputs of the layers, as opposed to learning unreferenced functions. We provide a wealth of empirical evidence to show that these residual networks are simpler to optimize and can benefit from significantly increased depth. On the ImageNet dataset, we evaluate residual networks with up to 152 layers, 8 layers more than VGG networks [40], but still with lower complexity. An ensemble of these residual nets has an error of 3.57 percent on the ImageNet test set. This result came in first place on the classification test for the ILSVRC in 2015.In addition, the findings of our investigation into CIFAR-10 with 100 and 1000 layers are presented.

The depth of representations is very important for a lot of visual recognition tasks.We achieve a relative improvement of 28% on the COCO object detection dataset solely as a result of our extremely deep representations. Deep residual nets are the foundation of our submissions to the ILSVRC and COCO 2015 competitions, where we also took first place in the tasks of ImageNet detection, ImageNet localization, COCO detection, and COCO segmentation.

INTRODUCTION

The "levels" of features can be enhanced by the number of stacked layers (depth), and deep networks naturally integrate low, middle, and high-level features and classifiers in an end-to-end multi-layer fashion [49]. The leading results [40, 43, 12, 16] on the challenging ImageNet dataset [35] all employ "very deep" [40] models, with a depth of sixteen [40] to thirty [16]. Deep convolutional neural networks have made it possible to make a number of Recent evidence [40, 43] demonstrates the significance of network depth. a lot of additional difficult tasks related to visual recognition [7, 11, 6, 32, and 27].
A query arises because of the significance of depth: Is it as simple as stacking more layers to learn better networks? The well-known issue of vanishing/exploding gradients, which prevent convergence from the get-go [14, 1, 8], was a barrier to answering this question. Normalized initialization [23, 8, 36, 12] and intermediate normalization layers [16] have, on the other hand, substantially solved this issue. These layers make it possible for networks with tens of layers to begin converging for stochastic gradient descent (SGD) with back-propagation [22].

A degradation issue has emerged when deeper networks can begin to converge: Accuracy may be expected to become saturated and then rapidly decline as network depth increases. As reported in [10, 41] and thoroughly verified by our experiments, adding more layers to a suitable deep model results in higher training error. This unexpected degradation is not caused by overfitting.Fig.1 gives a typical illustration.

The decrease in training accuracy suggests that not all systems are equally straightforward to optimize. Let's compare an architecture with fewer layers and a deeper one with more layers. The deeper model's construction-based solution exists: Identity mapping is one of the new layers, and the other layers are copies of the learned shallower model. A deeper model should not have a higher training error than a shallower model, as evidenced by the existence of this constructed solution. However, experiments demonstrate that the solutions that our current solvers are unable to Because of the significance of depth, a question arises: The well-known problem of vanishing/explodinggradients, which prevent convergence from the start [14, 1, 8], was a barrier to answering this question. Is it as simple as stacking more layers to learn better networks? On the other hand, normalized initialization layers [23, 8, 36, 12, and intermediate normalization layers] have substantially resolved thisissue. Back-propagation stochastic gradient descent (SGD) can begin to converge on networks with tens of layers thanks to these layers [22].

When deeper networks are able to begin to converge, there is a degradation problem: As network depth increases, accuracy is likely to become saturated and then rapidly decrease. A suitable deep model with more layers has a higher training error, as demonstrated by our experiments and reported in [10, 41]. Overfitting is not the cause of this unanticipated degradation.

The fact that training accuracy has decreased indicates that not all systems are equally simple to optimize. Let's compare an architecture with fewer layers to one with more layers in a deeper structure. There is a construction-based solution for the deeper model: The other layers are copies of the learned shallower model, and identity mapping is one of the new layers. This constructed solution demonstrates that a deeper model should not have a higher training error than a shallower model. Experiments, on the other hand, demonstrate that the solutions that our current solvers cannot.

Feed-forward neural networks with "shortcut connections" are capable of realizing the formulation of F(x)+x (Fig.2). Connections that skip one or more layers are called shortcut connections [2, 33, 48].In our circumstance, the shortcut connections merely perform identity mapping, and their outputs are added to the stacked layer outputs (Fig.2).Connections using identity shortcuts do not increase computational or parameter complexity. Backpropagation still allows for end-to-end SGD training of the network, and common libraries like Caffe [19] can be used to easily implement it without changing the solvers.
In order to demonstrate the degradation issue and evaluate our approach, we conduct extensive experiments on ImageNet [35].We demonstrate:1) While the counterpart "plain" nets, which simply stack layers, exhibit higher training error as the depth increases, our extremely deep residual nets are simple to optimize;2) Our deep residual networks produce results that are significantly superior to those of previous networks because they easily benefit from accuracy gains brought about by greatly increasing depth.

The CIFAR-10 set also exhibits similar phenomena [20], indicating that our method's optimization difficulties and effects are not limited to a single dataset. On this dataset, we explore models with more than 1000 layers and present successfully trained models with over 100 layers.

Extremely deep residual nets yield excellent results on the ImageNet classification dataset [35].Our 152-layer residual network is the deepest ImageNet network yet has a lower complexity than VGG networks [40].Our ensemble has a top-5 error of 3.57 percent on the residual learning principle, which we believe can be applied to other vision and non-vision issues.

Related Work

Contingent Representations Fisher Vector [30] can be thought of as a probabilistic version of VLAD, and VLAD [18] is a representation that encodes by the residual vectors in relation to a dictionary in image recognition. For image classification and retrieval, they are both effective shallow representations [4, 47].Encoding residual vectors is shown to be more efficient than encoding original vectors for vector quantization [17].

The widely used Multigrid method [3] reformulates the system into subproblems at multiple scales for the purpose of solving partial differential equations (PDEs) in computer graphics and low-level vision. Each subproblem is responsible for the residual solution between a coarser and a finer scale. Hierarchical basis preconditioning, which uses variables that represent residual vectors between two scales, is an alternative to Multigrid [44, 45].These solvers have been shown to converge much more quickly than standard solvers that are unaware of the residual nature of the solutions [3, 44, 45].Based on these approaches, it appears that an effective reformulation or preconditioning can make optimization simpler.

Shortcut connections are used in the implementation of methods for centering layer responses, gradients, and propagated errors in the papers [38, 37, 31, 46]. An "inception" layer is made up of a few deeper branches and a quick branch in [43]. One early method for training multi-layer perceptron's (MLPs) was to add a linear layer connecting the network's input and output [33, 48]. Shortcut connections are used in the implementation of methods for dealing with vanishing and expanding gradient
"Highway networks" [41, 42] present shortcut connections with gating functions concurrently with our research [15]. These gates, in contrast to our identity shortcuts, which do not have parameters, are dependent on the data and have parameters. When a gated shortcut is "closed" (approaching zero), the layers of highway networks represent non-residual functions. On the other hand, our formulation always learns residual functions; Our identity shortcuts pass all information through at all times, with additional residual functions to be learned. In addition, extremely high depth (more than 100 layers) has not been shown to improve accuracy in high-way networks.

Deep Residual Learning

Residual Learning

Consider H(x) to be an underlying mapping that can be fitted by a few stacked layers—not necessarily the entire net—with x serving as the inputs to the first of these layers. Instead of anticipating that stacked layers will approximate H(x), we explicitly allow these layers to approximate a residual function F(x):= H(x) x, resulting in the original function becoming F(x)+x. This is equivalent to hypothesizing that multiple nonlinear layers can asymptotically approximate the residual functions, i.e., H(x) x (assuming that the input and output are of the same dimensions).The learning curve might be different between the two forms, despite the fact that both forms ought to be able to approximate the desired functions asymptotically (as hypothesized).

The paradoxical aspects of the degradation problem (Fig.)serve as the impetus for this reformulation.1, left). As we discussed in the introduction, if the additional layers can be constructed as identity mappings, a deeper model should have a training error no greater than that of its shallower counterpart.

According to the degradation problem, it may be difficult for solvers to approximate identity mappings due to multiple nonlinear layers. To get close to identity mappings, the solvers may simply use the residual learning formulation to drive the weights of the multiple nonlinear layers toward zero if identity mappings are optimal.
Although identity mappings won't be useful in real life, our reformulation might help precondition the issue. If the optimal function is closer to an identity mapping than to a zero mapping, the solver should find the perturbations using an identity mapping rather than learning the function from scratch.
Experiments (Fig. 7) The fact that the learned residual functions typically have low responses suggests that identity maps provide adequate preconditioning and reduce the training error3. In the future, we will investigate the factors that contributed to these difficulties in optimization.
persistent networksThe 18- and 34-layer residual nets (ResNets) are then evaluated.As can be seen in Figure, the only change was the addition of a shortcut connection to each pair of 33 filters.The baseline architectures are identical to the plain nets that were mentioned earlier.3 (right); the first comparison is shown in Table 2 and Figure 1.4 (right); identity mapping is used for all shortcuts (option A), and zero-padding is used for increasing dimensions.
There are three significant observations presented in Table 2 and Figure. 4. With residual learning, the situation is reversed:the 34-layer ResNet is better than the 18-layer ResNet (by 2.8 percent).More critically, the 34-layer ResNet can be applied to the approval information and has an essentially lower preparing mistake.This demonstrates that the degradation issue is effectively addressed in this situation,and by increasing the depth, we can improve accuracy.
a 50-layer ResNet comprising this 34-layer net and this 3-layer bottleneck block (Table 1). For expanding aspects, we select option B.This model has 3.8 billion FLOPs.
152-layer and 101-layer ResNets:We construct 101-layer and 152-layer ResNets using more 3-layer blocks (Table 1). It is interesting that despite having a depth of 11.3 billion FLOPS, the 152-layer ResNet's complexity is still lower than that of the VGG-16/19 nets, which have a depth of 15.3 billion FLOPS.
The 50/101/152-layer ResNets are significantly more accurate than the 34-layer ones, as shown in Tables 3 and 4.We gain significantly from gains in depth accuracy that are significantly greater because we do not see the degradation issue.The advantages of depth are shown in all evaluation metrics (Tables 3 and 4).
comparisons with the most recent methods.The previous best single-model results are compared in Table 4.Our baseline 34-layer ResNets are very accurate.The best 5 approval blunder for a solitary model in our 152-layer ResNet is 4.49 percent.This single-model result outperforms every previous ensemble result, as shown in Table 5.Six models of varying depths are combined into an ensemble, with only two models having 152 layers at the time of submission. This ensemble has a top-5 error of 3.57 percent on the test set (Table 5). In 2015, this entry won first place in ILSVRC.

CIFAR-10 and Analysis

We carried out additional research on the CIFAR-10 dataset [20], which includes ten thousand test images and fifty thousand training images divided into ten classes.We present experiments that were conducted on the test set and trained on the training set.We deliberately employ the following simple architectures because our focus is not on advancing cutting-edge results but rather on the behaviors of extremely deep networks.
The plain/lingering designs follow the structure in Fig.3 (right/middle)The per-pixel mean has been subtracted from 3232 images for the network inputs.There are 33 solutions in the first layer.On the feature maps of sizes 32, 16, and 8 respectively, we use a stack of 6n layers with 3n solutions, with 2n layers for each size.There are 16 filters, 32 filters, and 64 filters, respectively.The subsampling is per-framed by convolutions with a step of 2.A 10-way fully connected layer, a global average pooling, and a

softmax complete the network.There are six stacked weighted layers total, plus two.The architecture is summarized in the following table:
have the same error in training.We argue that overfitting is to blame for this.For this small dataset, the 1202-layer network may be unnecessarily large (19.4M).On this dataset, the best results ([9, 25, 24, 34]) are obtained by employing robust regularization, such as maxout [9] or dropout [13].Without detracting from the focus on the difficulties of optimization, we use no maxout/dropout and simply impose regularization through deep and thin architectures by design in this paper.However, we will investigate whether combining with stronger regularization leads to improved outcomes in the future.

Object Detection on PASCAL and MS COCO

When it comes to generalization, our method performs well on other recognition tasks.Our detection method is Faster R-CNN [32]. We are interested in the advantages of switching to ResNet-101 from VGG-16 [40]. Since both models use the same detection implementation (see appendix), the gains can only be attributed to improved networks. The object detection baseline results for PASCAL VOC 2007 and 2012 [5] and COCO [26] are presented in Tables 7 and 8.Most impressively, on the difficult COCO dataset, we achieve a relative improvement of 28% in COCO's standard metric (mAP@[.5,.95]), or a 6.0% increase.This gain comes only from the learned representations.

Using deep residual nets, we won first places in several tracks at the ILSVRC and COCO 2015 competitions: The specifics are provided in the appendix for COCO detection, COCO segmentation, ImageNet localization, and ImageNet detection.

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A Research Paper on Internet of Things (IOT): Research Challenges and Imminent Applications

ABSTRACT

As the Web of Things (IoT) continues to advance as the resulting period of the Web's development, it becomes essential to perceive the various possible spaces for IoT applications as well as the exploration challenges associated with these applications. Smart cities, smart health care, smart agriculture, logistics, retail, and smart living and environments are just a few of the areas where the Internet of Things (IoT) is expected to permeate everyday life. Even though technologies that enable the Internet of Things (IoT) have made significant progress over the past few years, there are still a lot of issues that need to be addressed. Numerous research issues will undoubtedly arise because the Internet of Things (IoT) concept is the result of multiple technologies. The Internet of Things (IoT) is a significant research topic for studies in various related fields like information technology and computer science due to its vast scope and impact on virtually every aspect of our lives. As a result, IoT is opening up new research opportunities. The latest improvements in Web of Things (IoT) innovation, as well as possible applications and exploration challenges, are introduced.

Keywords—Internet of Things; IoT applications; IoT challenges; future technologies; smart cities; smart environment; smart agriculture; smart living

INTRODUCTION

It is becoming increasingly important to understand the various potential applications for the Internet of Things (IoT) and the exploration challenges associated with these applications as the Web of Things (IoT) continues to advance as the resulting period of the Web's development. The Internet of Things (IoT) is anticipated to permeate everyday life in a number of areas, including smart cities, smart health care, smart agriculture, logistics, retail, and smart living and environments. Even though the technologies that make the Internet of Things (IoT) possible have made a lot of progress over the past few years, there are still a lot of problems that need to be fixed. Because the Internet of Things (IoT) concept is the result of multiple technologies, there will undoubtedly be numerous research issues. Due to its vast scope and impact on virtually every aspect of our lives, the Internet of Things (IoT) is a significant research topic for studies in various related fields like information technology and computer science. IoT is creating new research opportunities as a result. The most recent advancements in Internet of Things (IoT) innovation are presented, in addition to potential applications and exploration difficulties.

Information can now be shared over the Internet between a plethora of devices, including smartphones, automobiles,industrial systems, cameras, toys, buildings, home appliances, and industrial systems. On the other hand,

the Internet ofThings (IoT) functions as a network of various "connected" devices—a network of networks [3].Regardless of their sizes or functions, these devices are capable of intelligent reorganizations, tracing, positioning, control, real-time monitoring, and process control. Over the past few years, there has been a significant increase in the number of Internet-capable devices. despite the fact that its greatest commercial impact has been felt in the consumer electronicsindustry; i.e., specifically, the rise in demand for wearable technology like headphones, watches, and others Additionally, the revolution that was brought about by smartphones has developed into a subset of a larger trend toward bringing the physical and digital worlds together.

In light of all of this, it is anticipated that the Internet of Things (IoT) will continue to expand its reach in terms of the number of devices and functions it can run. The word "Things" is ambiguous, making it difficult to describe the IoT's ever-increasing limits [4]. The Internet of Things (IoT) constantly presents an almost endless supply of opportunities, not only for businesses but also for research. This is made clear by the word "Things." As a result, the study focuses on the various IoT domains' potential uses and the research difficulties associated with these uses.

I. POTENTIAL APPLICATION DOMAINS OF IOT

There are numerous potential applications for the internet of things that can be found in almost every aspect of people's, institutions', and society's day-to-day lives. According to [5], the manufacturing or industrial sector, agriculture, smart cities, security, and emergency situations are just a few of the many applications of the Internet of Things (IoT).

A. Smart Cities

The Web of Things, as expressed in [6], assumes a pivotal part in improving general framework and making urban communities more clever. In the following ways, smart cities can be built using the Internet of Things (IoT):Examples of intelligent transportation systems include smart buildings, traffic congestion, waste management, smart lighting, smart parking, and urban maps [7, 8]. These systems could also monitor the levels of pedestrians and vehicles, the vibrations and material conditions of bridges and buildings, the availability of parking spaces within the city, and the installation of sound monitoring devices in cities' most sensitive areas. The Internet of Things, which is made possible by Artificial Intelligence (AI), can be used in Smart Cities to monitor, control, and reduce traffic congestion [6]. IoT also makes it possible to monitor the schedules for trash collection, install intelligent and weather-adaptive street lighting, and detect waste and waste containers. Information and warnings, such as access to weather-dependent detours or unexpected occurrences like accidents and traffic jams, can be provided by intelligent highways.

B. Healthcare

The majority of healthcare systems in many countries are inefficient, slow, and bound to make mistakes. This can be easily changed because the healthcare industry relies on numerous technologies that can be automated and improved. The addition of additional technology that is capable of facilitating a variety of operations, such as the sharing of reports to multiple individuals and locations, record keeping, and medication dispensing, would significantly alter the healthcare industry [10].

One of the many benefits that Internet of Things (IoT) applications provide to the healthcare sector is the ability to track patients, staff, and objects, as well as identify and authenticate individuals. The workflow of a hospital can be significantly improved once patient flow is tracked. Due to authentication and identification, there are also fewer instances of infant mismatches and incidents that could be harmful to patients. Process robotization, the reduction of structure handling schedules, computerized system evaluation, and clinical stock management all depend on programmed information collection and transmission. Sensor devices make it possible for patient-centered functions like diagnosis and real-time access to information about a patient's health indicators [6].In many nations, the majority of healthcare systems are ineffective, slow, and inevitably error-prone. Since the healthcare industry relies on numerous technologies that can be automated and improved, this can be easily changed. The healthcare industry would be significantly altered by the addition of additional technology that is capable of facilitating a variety of operations, including the sharing of reports to multiple individuals and locations, record keeping, and medication dispensing [10].

The automatic collection of data and sensing, the identification and authentication of individuals, and the tracking of patients, staff, and objects are among the many advantages that IoT applications offer in the health care industry. Once patient flow is tracked, hospital workflow can be significantly improved. Additionally, there are fewer instances of infant mismatches and incidents that could be harmful to patients thanks to authentication and identification. Furthermore, programmed information assortment and transmission is imperative in process robotization, decrease of structure handling timetables, computerized system evaluating as well as clinical stock administration. Patients-centered functions like diagnosis and real-time access to information about patients' health indicators are made possible by sensor devices [6].

C. Smart Agriculture and Water Management

According to [11], the Internet of Things (IoT) has the potential to strengthen and improve the agricultural sector by monitoring the diameter of vineyard trunks and soil moisture. The Internet of Things would allow for the control and maintenance of the amount of vitamins found in agricultural products, as well as the regulation of microclimate conditions, in order to maximize the production of fruits and vegetables and the quality of those fruits and vegetables. Weather conditions like ice, drought, changes in the wind, rain, or snow can also be predicted, allowing for temperature and humidity control to prevent fungus and other microbial contaminants.

IoT can assist with recognizing steers that brush in open regions, distinguish destructive gases from animal fecal matter in ranches, control the development states of posterity to work on their possibilities of wellbeing and endurance, etc. Through the use of IoT in agriculture, a lot of waste and spoilage can be avoided by properly monitoring and managing the entire agriculture sector. It also makes management of electricity and water better. The Internet of Things, according to [11], plays a role in water management by detecting pressure variations in pipes, detecting liquid presence outside tanks, determining whether seas and rivers' water is suitable for agriculture and drinking, and monitoring water variation levels in dams, rivers, and reservoirs. These Internet of Things applications make use of wireless sensor networks. IoT applications that are already in use in this area include: SiSviA, GBROOS, and SEMAT.

D. Retail and logistics

There are numerous benefits to incorporating the Internet of Things into retail management or the supply chain. These are some: The Internet of Things (IoT) can be used for a variety of purposes inside retail establishments, including controlling the rotation of products on shelves and warehouses in order to automate restocking procedures, directing customers through the store based on a predetermined list, expediting payment procedures like automatically checking out with the aid of biometrics, identifying products that may contain allergens, and so on [12]. Additionally, the IoT can be used for processing payments according to location or activity period in theme parks

E. Smart Living

The Internet of Things can be used in remote control devices to turn on and off appliances from a distance, preventing accidents and saving energy [1, 3]. LCD (liquid crystal display) refrigerators are another type of smart home appliance. These screens let you see what's inside, what has gone over its time span of usability and is going to lapse, and what should be restocked. You can also link this data to an app for your smartphone, allowing you to access it and buy what you need when you're outside. Additionally, washing machines may make it possible to monitor the laundry remotely. A smartphone interface is also available for a wide range of kitchen appliances, allowing for oven-like temperature control. In addition, some ovens that have the ability to clean themselves can be easily monitored. Alarm systems and the installation of cameras to monitor and detect window or door openings can be used to implement the Internet of Things in terms of home security [3].

Smart Environment

A healthy environment affects all living things, including humans, animals, birds, and plants, in some way. Smart Environment In every aspect of life, the environment is very important. Numerous efforts have been made to create a healthy environment by reducing resource waste and pollution. However, the environment is constantly harmed by the presence of industries, waste from transportation, and careless and harmful human behavior. As a result, eco-friendly and cutting-edge approaches to waste monitoring and management are necessary for the environment. Governments are compelled to implement systems that will protect the environment as a result of the substantial amount of data provided by these methods.

II. RESEARCH CHALLENGES

There must be sufficient feasibility in the various domains for some of the IoT applications listed above to be considered viable and functional. As with any new technology or innovation, the Internet of Things (IoT) faces challenges and consequences that must be resolved for widespread adoption. Even though the technologies that enable the Internet of Things (IoT) have made significant progress in recent years, there are still a lot of problems that need to be fixed, paving the way for new areas of research. The Internet of Things (IoT) concept is the result of numerous data sensing, collection, action, processing, inference, transmission, notification, management, and storage technologies. As a result, there are bound to be numerous research challenges. Consequently, these research issues that demand attention span numerous research fields [14].

Privacy and Security

Due to its growing use, the Internet of Things (IoT) requires adequate security and trust functions because it has emerged as a crucial part of the internet's future. Researchers are aware of the flaws that a lot of IoT devices currently have. Additionally, because the Internet of Things is built on top of the existing wireless sensor networks (WSN), it inherits the same privacy and security issues as WSN architecturally [3, 15]. Weaknesses and attacks on IoT systems demonstrate the necessity of comprehensive security designs that safeguard data and systems throughout their entirety. This security gap further motivates comprehensive security solutions that include research that is effective in applied cryptography for the security of data and systems, non-cryptographic security techniques, and frameworks that assist developers in creating safe systems on heterogeneous devices. The majority of attacks take advantage of flaws in particular devices to gain access to their systems and render secure devices vulnerable [16, 17].

Data Processing, Analysis, and Management

The process of processing, analyzing, and managing data is extremely difficult due to the heterogeneous nature of the Internet of Things (IoT) and the large amount of data collected, especially in this Big Data era [18].The majority of systems currently use centralized systems to offload data and perform computationally demanding tasks on a global cloud platform. However, conventional cloud architectures are frequently criticized for their inability to transfer the enormous amounts of data generated and used by IoT-enabled devices, support the associated computational load, and simultaneously meet timing constraints [19].To overcome this obstacle, the majority of systems are relying on current solutions like fog computing and mobile cloud computing, both of which are based on edge processing. Application of Information Centric Networking (ICN) in the Internet of Things (IoT) is another area of data management research. These information centric systems support efficient content retrieval and access to services, and they appear to be quite useful not only for accessing but also transferring and managing generated content and its transmission. However, this solution comes with a number of problems, such as how to effectively extend the ICN paradigm to the fixed network edge, how to include IoT static and mobile devices, and how to distribute the functionality of ICN to devices with limited resources [19].

Monitoring and Sensing

Even though technologies for monitoring and sensing have made a lot of progress, they are always changing, especially with an emphasis on energy efficiency and form. Because it is typically expected that sensors and tags will be active at all times in order to obtain instantaneous data, this feature is crucial for energy efficiency, particularly in terms of lifetime extension. At the same time, advances in nanotechnology and biotechnology as well as miniaturization have made it possible to create actuators and sensors on the nanoscale.

M2M (machine to machine) communication and protocols

There are already IoT-focused communication protocols like Constrained Application Protocol (CoAP) and Message Queuing Telemetry Transport (MQTT), but there is still no standard for an open IoT. All objects need to be connected to the internet, but they only need to be able to store their data on a specific gateway. Also, there are a lot of options for suitable wireless technologies like LoRa, IEEE 802.15.4, and Bluetooth, but it's not clear if these available wireless technologies will be able to cover the entire IoT connectivity range in the future.

Things on a Blockchain (BCoT): Combination of Blockchain and IoT

The Internet of Things (IoT) and Blockchain have the potential to strengthen one another in a reciprocal manner by overcoming the architectural limitations that each has [22]. Similar to the IoT, blockchain technologies have also gained a lot of popularity since their introduction in 2018. Despite the fact that it was initially implemented as an underlying technology of Bitcoin cryptocurrency, blockchain is currently being utilized in a variety of nonmonetary applications.

In contrast, the inherent security, immutability, trust, and transparency of blockchain are the primary reasons for its adoption in non-monetary applications. As a result, IoT also faces privacy and security issues, just like WSN. These features are powered by distributed ledger technologies (DLTs) and consensus-based blockchain technology, both of which heavily rely on participating nodes. IoT "things" can participate as nodes in blockchain ecosystems while blockchain strengthens IoT by adding an additional layer of security [22]. As a result, blockchain-enabled IoT environments will provide improved general security [23] and advantage over one another. The Blockchain of Things (BCoT) is the result of the combination of Blockchain and Internet of Things (IoT).

Interoperability

Interoperability has traditionally been and continues to be a fundamental value for the internet because "connected" systems must be able to "speak a similar language" in terms of encodings and protocols as the initial prerequisite for Internet connectivity. Currently, numerous industries provide a variety of standards to support their applications. Due to the large amounts and types of data as well as the heterogeneous devices, using standard interfaces in such diverse entities is very important, and it is even more important for applications that support cross-organizational collaboration. As a consequence of this, the systems that make up the Internet of Things are supposed to be built to handle even higher levels of interoperability [24].

III. CONCLUSION

The Internet of Things is best described as a CAS (Complex Adaptive System) that will continue to evolve, necessitating novel software engineering, systems engineering, project management, and other disciplines in order to further develop and manage it over the coming years. The Internet of Things can satisfy the requirements of a wide range of users thanks to its numerous applications. The technology is used by three kinds of people: institutions, communities, and individuals, As discussed in the application section of this research paper, the Internet of Things (IoT) has, without a doubt, a tremendous potential to be a tremendously transformative force that will, and to some extent already has, positively impacted millions of lives worldwide. According to [25], this has become even more evident as a result of various governments around the world showing an interest in the concept of the Internet of Things by providing additional funding for research in the area to facilitate further study. An excellent illustration is the Chinese government.

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Are E-Books Replacing Print Books?

Abstract

The purpose of this article is to comprehend academic historians' use of e-books for teaching and research. This includes looking into their understanding of and perceptions of the features of this developing research tool. The development of an interview guide was guided by Rogers' model of the innovation-decision process for the study. Between October 2010 and December 2011, ten semi-structured interviews with history professors were conducted. The data was analyzed and coded using a grounded theory method. The foundation for the creation of learning opportunities for the professional development of historians and the academic librarians who work with them is provided by findings regarding tradition, cost, teaching innovations, and the process of historical research. Historians are open to trying out e-books, but they are also worried about the loss of serendipity in digital environments, the lack of key resources, and the need for technological transparency. The findings indicate that scholars alternate between Rogers' knowledge and persuasion stages, which are cyclical in nature. Even though they didn't know much about e-books, the interviewees were already weighing the five characteristics of the persuasion stage. The findings of the study have implications for our comprehension of the diversity of academic innovation: Without one replacing the other, both print and digital collections are being used simultaneously.

Introduction

The "format of the academic future" has recently been dubbed (Schwartz, 2012, para.7), according to Sporkin (2012), e-books have grown at an unprecedented rate over the past few years. A renewed interest in this technology has resulted from the introduction of mobile prototypes for accessing e-books, such as tablets, e-readers, and cell phones (Tonkin, 2010).Not only are the devices used to read, edit, and annotate e-books constantly evolving and taking on novel forms, but also the e-book itself is undergoing a number of transformations. From Project Gutenberg (2007), which included books typed into Hyper Text Markup Language (HTML), Portable Document Format (PDF), or other file formats, to Google Books (2011), which created PDFs of the physical books by scanning them and uploading them to the web, more comprehensive e-book projects have experimented with a variety of formats. Nowadays, many e-books were "born digital"; They are completely distinct from their printed counterparts, are created online, and can only be accessed online. With the creation of the Digital Public Library of America (http://dp.la/) and the availability of electronic books through online catalogues of public and academic libraries, e-books are receiving a lot of attention. The impact of e-books on scholars cannot be ignored, as some academic libraries have chosen to digitize their entire collections (Michigan Library, 2012).In addi-tion, there has been a new pattern toward the computerized humani-ties, with humanities researchers embracing a great many computerized devices (Dalbello, 2011;(2008) (Toms & O'Brien).Therefore, it is essential to investigate the ways in which humanists are using e- books for teaching and research.

The following section provides a summary of the existing research, first focusing on humanists' general information-seeking behaviors and practices and then on how they use new teaching and research methods. The theoretical framework for this study is presented following this overview, laying the groundwork for an investigation into e-book adoption. To comprehend the various stages of decision-making that a potential user goes through before adopting or rejecting an innovation, we make use of Rogers' (1983, 2003) theory of the innovation-decision process. This section focuses on Rogers' theory's first two stages—knowledge and persuasion—where potential users acquire information that will shape their perception of the innovation. Because historians, like many other academics, are just beginning to use e-books, these stages were chosen as the focus. The methods used in this study to investigate the research objectives are described in the following section. We used a

grounded theory method to analyze the data and carried out semi structured interviews with ten historians. To illustrate the main themes that emerged from the analysis, the findings are presented alongside quotes that are interwoven throughout. We conclude with a discussion of the ways that historians' attitudes toward e-books can influence the rate at which this population adopts this tool.

Literature Review

The Research Practices of Humanities Scholars

This section first provides a brief overview of the humanist literature and then discusses the body of work that specifically examines historians to better understand their research methods. Since the groundbreaking work of Sue Stone (1982), the information-seeking behavior of humanists has been the subject of much scholarly interest. How to define and delimit the elusive concept of the humanities has been a significant literary theme (Gould, 1988;1977, Krummel;2002, Palmer and Neuman;Stone, 1982).Humanist scholarship's overarching objectives, namely to "reinterpret and re-evaluate our textual legacy in an evolving understanding of larger historical, social, and cultural contexts," should be examined in light of the concept's shortcomings (Pavliscak, Ross, & Henry, 1997, para.23).Because of this, it is necessary to investigate humanists' perspectives on text as a primary or secondary source, their approach to resource collection, their relationship to libraries, and how they incorporate digital and electronic resources into their work.

Although many studies of information-seeking behavior in the humanities focus solely on a single field, they frequently discuss groups of humanists in particular fields. For example, Case (1991) concentrated on the way of behaving of 20 American students of history through a blend of meetings and a thor-ough assessment of their distributed articles and mono-diagrams. He noted that 17 of the 20 participants were actively using computers in their research as early as 1988 and that they made extensive use of the library and archives. These findings demonstrate that historians were already beginning to incorporate computers into their work for word processing, database applications, and statistical analysis more than two decades ago, proving that the myth that historians are reluctant to use technology is untrue.

Delgadillo and Lynch's (1999) investigation of how historians seek information spans more than a decade. They discovered that historians valued the library highly, appreciated having a good relationship with their subject specialist librarian, and were enthusiastic about technology. In contrast to Barrett's (2005) graduate students, Duff and Johnson (2002) examined the historians' use of the archive through a series of semistructured interviews. They discovered that the historians' information-seeking behaviors were haphazard only during the initial stages of their research. Historians, on the other hand, used more methodical and deliberate approaches to their research when establishing the context for their subject matter.

The Adoption of ICTs on Campus

There is a lot of research on campus ICT adoption (Haythornthwaite & Andrews, 2011;(1999, Rogers)Until now, the majority of these studies have primarily focused on faculty and their rates of adoption of learning technologies, including obstacles and challenges they have encountered. The Electronic Academy, an education system that aims to deliver bachelor's and master's degrees entirely electronically within the Midwestern United States, was included in Patricia Rogers' 1999 study of barriers to technology adoption. The most significant impediment to adoption was found to be adopters' attitudes and perceptions of the technology, according to this study. Concerns about technology (such as the availability of software or hardware), the institution's financial backing, and adequate technical support in the form of knowledgeable staff were additional obstacles identified in the study.

In order to comprehend faculty adoption of technology, Nicolle and Lou (2008) carried out a mixed methods study that included surveys and interviews. They discovered that institutional and peer support were most likely to boost adoption. The study also found that faculty value the potential benefits of integrating technology into academia, but they don't think they have enough time or space to work together and consult with others in ways that would help them learn more about and use these learning tools. According to Nicolle and Lou (2008), providing and designing adequate professional development to support faculty adoption of ICTs is just as important as the technology and its benefits.

According to Brunson (2008), the most significant obstacle that e-books must overcome is tradition: Students and the general public are used to purchasing, browsing, and reading printed texts. According to Walton (2008), tradition is another apparent impediment to e-book adoption. He makes the reference to the "familiar concept of the book" (p. 363).According to Carlock & Perry (2008), studies have consistently shown that humans in particular have a great love for the written word.(2008) (Toms & O'Brien).Working with print materials as primary and secondary sources shapes their research methods and habits (Case, 1991;(2004) Dalton and Charnigo

Theoretical Framework

The study of how new technologies or innovations are used has received a lot of academic attention. Diffusion of Innovations by Everett Rogers is widely regarded as the definitive work on the subject (Brunson, 2008;2011 by Kim and Crowston;2008, Nicolle and Lou;(2008) Walton Over the past fifty years, the field as a whole has experienced significant expansion. According to Rogers (1983), the number of publications in the region had increased from 405 in 1962 to 3,085 in 1983.There were 54,619 results for the search term "diffusion and innovation" on Scholars Portal1 in 2010, but these numbers do not take into account the numerous publications in related fields like engineering, science, and medicine.

Methods

Information for the current review were accumulated through a progression of meetings going on around 30 to an hour and directed with 10 teachers in the set of experiences branches of establishments of advanced education in Southwestern Ontario from October 2010 to December 2011.The findings document the state of affairs at a specific time in the adoption of the technology because each year, e-books relevant to history become more readily available. As a result, it is important to keep the time frame of the data collection in mind .Respondents took part in semi structured interviews that were recorded using digital recording equipment and then transcribed for coding. There are two reasons for our small sample size.To begin, rather than obtaining large quantities that could be quantified, the study's objectives called for in-depth interviews with historians to ascertain their attitudes and perceptions. Second, the process of recruiting scholars as a whole takes a lot of time.It took more than a year to find the ten participants for this study. We distributed emails to department chairs for distribution to faculty email lists and placed posters in history departments subject to ethics approval. Most importantly, we found that after 10 interviews, saturation had been reached for the key themes under investigation after careful consideration of the codes. According to Corbin & Strauss (2008), qualitative research reaches saturation when no additional insights are obtained from additional data.

Corbin and Strauss (2008), on the other hand, warn that researchers who use previously established theoretical frameworks in their analysis should remain open to learning from the data and coding for novel concepts."[t]he importance of' remaining open' is essential even for experienced researchers working on their own program of research," they emphasize (p. 40).Our interview guide and coding scheme were based on Rogers's model, which provided the necessary terminology and structure for the current investigation. As a result, the coding developed in this method as a synthesis of previously established theoretical understandings and data-derived insights.

Findings

The Definition of the E-book

The researchers decided that no definition of the book would be provided prior to beginning the data collection process to avoid influencing the participants' mental processes. The question at the beginning of the interview guide, rather than providing details about e-books, was How well-versed are you in e-books? Two of the ten participants confidently stated that they were familiar with e-readers (despite the fact that one of them stated that he had never used one, and the other only mentioned e-readers), two said, "I know what they are," four said, "some-what" or "moderately" familiar, and two said, "not very familiar" at all with e-books.

There were a few scenarios regarding the definition of the term "e-book" as the interviews progressed. Three of the participants inquired about the researcher's definition of an e-book. The researcher responded that the interview would focus primarily on the digital document, but that e-readers would also be discussed and that it was crucial to try to keep the two separate whenever possible. When asked about their familiarity with e-books and the difference between a digital document and an e-reader, Ben and Frank, two historians, noted the complexity of the term. These digital documents are used for research. Participants frequently did not realize they had previously used an e-book, despite not knowing it at the time, until later in the interviews, during a discussion of the technology and its characteristics. Linda and Frank, two of the participants, questioned whether other digital documents—particularly databases and journal articles—could also be considered e-books or would be categorized as a distinct digital artifact. Because they were familiar with and had used these electronic resourcesextensively, participants frequently attempted to connect their knowledge of e-books to their knowledge of e-journals and databases.

Participants were unsure about whether documents that are freely accessible both online and through the library portal could be considered e-books, as the following quote from Linda demonstrates. The Google Books assortment added one more advanced design, making further disarray about which organizations to consider digital books.

Negative Attitude Towards Technology

There were two predominant viewpoints regarding e-books: one that was mostly bad and the other that was good. Members couldn't just be delegated having either: Depending on the characteristics of the ebook they were discussing, the participants frequently displayed either of these attitudes during the interviews. Interestingly, scholars considered using this

format for teaching purposes and found that the cost of e-readers and e-books was both a positive and negative factor. Users' negative attitudes toward e-books were caused by four main factors, which are discussed next.
the factor of availability. It was anticipated that every historian would be concerned about the accessibility of the documents with which they interact frequently. However, scholars' apprehension about books being digitized focused on how the digitization (or lack thereof) of historical documents might affect the next generation of scholars in this field, not on how difficult it would be for them to access works. Marleen expresses her concern regarding the exclusion of particular documents if they are not digitized.

The luck factor. E-books and e-readers are convenient because they don't require the researcher to go directly to the library to look for documents. But what else is left out of the research process when this step is skipped. The serendipitous find is one of the well-established beliefs in the field of history (Case, 1991;1999, Delgadillo and Lynch;2007 Hoeflich).This occurs when a scholar searches for books, journals, magazines, or archival records directly on the shelves and discovers a source other than the one they were looking for .In the interviews, it became clear that historians are concerned about the ways in which the convenience of e-books might affect how they seek information.

The issue of cost. In addition to the initial digitization of the texts, purchasing e-readers and e-books entail significant expenditures. The participants were concerned about putting their students further in financial straits and had the impression that they did not have access to sufficient information regarding the price of e-books. One of the professors who was very concerned about the requirements of his students expressed his worries regarding the price:

the element of tradition. These historians saw themselves as traditionalists in more ways than just going to the stacks for material. For the purposes of their research, switching to an electronic book was typically used as a last resort, either because they were writing late at night and had forgotten a source they needed, or because they knew precisely what they were looking for and wanted that information. The participants were of the opinion that when it came to reading e-books on their screens, it was unlikely that they would ever read an entire e-book as they would a physical copy, which they perceived to have features that were beneficial to their scholarship.

Although she had not yet implemented e-books in her classroom, Linda indicated that she would use them for teaching. She was interested in more than just the accessibility options that would be available to students; she was also interested in what her students might learn about the physical book when they are forced to write in a format that is unfamiliar to them:

Cost advantages It was primarily on behalf of their students that the participants had positive perceptions of the cost of e-books. Two of the participants stated that they would readily use e-books in the classroom or for assignment purposes if it was a cheaper option than having the students purchase the text in print. They expressed a strong desire to keep costs low for the students. The historians freely admitted that they lacked knowledge in this area. Adam declares:

It's possible that the low cost of the e-books available on campus is a factor in their popularity with students and instructors alike.

In conclusion, the majority of participants were only beginning to use e-books: Although they were aware that they existed, they had not yet used them for anything other than taking notes and searching for books online. The participants were most intrigued by the concept of being able to obtain out-of-print books without having to travel. The most difficult obstacle to overcome will be the tradition factor, or preference for the printed book, particularly among historians who work so closely with texts.

Discussion

An unexpected complexity resulted from the inquiry into how familiar historians are with the electronic book. According to the findings of the study (Vassiliou & Rowley, 2008), the definition of the book continues to be a source of confusion. A subset of participants did not realize that digital documents from online collections like Google Books "counted" as e-books, leading them to believe they had little to say about e-books because they had never used them before. The distinctions between e-readers, electronic books, electronic journals, and other digital formats were unclear to three academics. From one viewpoint, this disarray dialed back the course of reception. The e-book was difficult for historians to comprehend in terms of its relevance to their work because of its complexity and lack of transparency. Reduce any uncertainty associated with this technology was difficult as a result of this.

The current study of historians reveals that Rogers's (2003) innovation decision model's knowledge and persuasion stages are cyclical and iterative processes rather than independent processes. Although Rogers (2003)'s model's stages did not assume complete independence (see Figure 1), the connection between them is neither adequately explained nor investigated. Rogers suggested that the order of the stages could change, which the current study strongly supports. The scholars of history in this study believe that the steps in this process are closely linked. These historians have frequently been introduced to e-books without them being aware of or even aware of the technology they were using. This indicates that, according to historians and e-books, the adoption stages of knowledge and persuasion have combined, and the process is now more cyclical than linear. That is, they alternate between learning specific details about the technology, putting it to the test, and evaluating its characteristics in relation to their personal lives, academic pursuits, and teaching responsibilities.

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ARTIFICIAL INTELLIGENCE IN COMPUTER VISION

Abstract-
The study of ways to make computers more capable of seeing falls under the category of computer vision. The most abstract goal of computer vision research is to infer something about the world from observed picture data. It is a multidisciplinary field that can be looselydivided into the areas of machine learning and artificial intelligence, both of which can employ both specialized and general-purpose learning strategies. Because it is a research area that spans engineering and computer science, its methods may appear disorganized becauseit is an interdisciplinary field. While a hand-crafted statistical method may be sufficient to address one particular vision issue, a vast and complex collection of generic machine learning algorithms may be required to address another. The field of computer vision is at the cutting edge of science. It is thrilling and chaotic, just like any frontier, and there is frequently no reliable authority to turn to. There is notheoretical foundation for many beneficial concepts, and some theories are rendered ineffective in practice; Because they are so dispersed,developed regions frequently appear to be impossible to reach from one another.

Keywords—Computer vision, Artificial intelligence, Neural networks,CNN., Deep learning, machine learning

I. INTRODUCTION

As a result of the numerous applications, it has found in fields like health and medical, sports and entertainment, automaton design, andself-driving cars, computer vision has recently gained traction and popularity. Visual recognition tasks like image order, restriction, and identification are used by many of these applications. Convolutional Neural Networks' (CNNs) recent advancements have resulted in exceptional performance in these world-class visual recognition tasks and frameworks, demonstrating their power. As a result, convolutional neural networks (CNNs) have emerged as the fundamental building blocks of computer vision's deep learning computations.Profound Brain Organizations (DNN) is a sort of brain network that has better picture ID abilities and is many times used in PC vision calculations. A subtype of Deep Neural Networks (DNNs) known as Convolutional Neural Networks (CNN) is frequently utilized in the decoding of visual signs. It is also used to organize data in Computer Vision and Natural Language Processing (NLP).Using a variety of structural blocks, a convolutional neural network can be built. Convolution layers, pooling layers, and fully connected layers are all structural blocks that will be briefly discussed in this article. The author discusses Deep Learning and the numerous neural network techniques grouped together in the subsequent sections. Convolutional neural networks, their construction, and their applications in engineering and medicine are also covered in this book.

II. LITERATURE SURVEY

A. Deep Learning and Neural Networks

Machine Learning is a subset of Artificial Intelligence (AI), which is a subset of Deep Learning. Algorithms and training data are used inmachine learning to quickly and automatically identify patterns. A technique for teaching computers to behave like humans is known as artificial intelligence. In addition, an artificial neural network serves as a symbolic representation of the human brain's

structure and function in Deep Learning.12] Although deep learning was first proposed in the 1980s, it has recently demonstrated

significant benefits for two primary reasons:

A. A significant amount of knowledge is required for this. The creation of autonomous vehicles, for instance, necessitates the collectionof numerous photographs and lengthy video clips.

B. A large recording capacity is needed for deep learning. GPUs with high performance provide an effective parallel design that is idealfor deep learning. This significantly reduces the amount of time required to train a deep learning network from weeks to hours or less when used in conjunction with clusters or cloud computing.11]. Numerous issues can be resolved using deep learning. In the article's concluding section, for instance, the author goes over autonomous driving, aerospace and military, medical research, industrialautomation, and electronics in greater depth.

An algorithm that processes certain input parameters with an Activation Function to produce the desired output is known as a neural network. A neuron is the component responsible for processing inputs and outputs in this approach. Take the fundamental example of determining a home's purchase price. The Price component is affected by a variety of factors, each of which must be taken into consideration. Examples include the room's square footage, number of bedrooms, and zip code.As a result, if we consider price to be an Output, the Neural Network that follows demonstrates how a neural network might produce that Output by taking the parameters that were mentioned earlier as inputs.

Each circle represents a neuron that receives an Activation Function that combines distinct values for various input parameters to computethe desired Output. The purpose or application of the algorithm determines the Activation Function .For instance, each circle represents aneuron that receives an Activation Function that combines distinct values for various input parameters to compute the desired Output. Thepurpose or application of the algorithm determines the Activation Function. The goal, for instance, is to determine a house's maximum price in the example above . Let's assume, for the sake of simplicity, that the size and the number of bedrooms are the only two input variables. In this case, the price of a house goes up if it is larger and has more bedrooms. As a result, the Neuron Activation Function willbe defined to select the highest possible value for each input parameter and then compute the Output. Evidently, this appears to be very simple in this instance; however, when a large number of factors are involved, making decisions based solely on maximum or minimum values is not as simple. Data-driven machine learning comes into play at this point. The method makes use of saved (learned!) data. fromprevious instances in order to use the Activation Function to determine the best Output. The above model shows a Standard Brain Organization, which is frequently used to create Result from measurable, mathematical, and other quantitative information. The kind of data that goes into the algorithm determines which kind of neural network to use.The capabilities of various neural networks for processingvarious types of input data are summarized in the table below.1] For the remainder of this article, the author will solely concentrate on the Deep Learning-based Convolutional Neural Network technique.

B. Deep Learning using Convolutional Neural Network forComputer Vision

A convolutional neural network (CNN), also known as a ConvNet, is a type of deep neural network that is frequently utilized in deeplearning for the analysis of visual images. It is also known as a convolutional neural network (CNN) in some contexts. Due to their shared-weights architecture and translation invariance properties (SIANNs), these artificial neural networks are referred to as shift-invariant artificial neural networks or space-invariant artificial neural networks. Pictures and videos can be identified, recommender systems can be built, images can be categorized, medical images can be analyzed, and natural language can be evaluated using algorithms. The authordiscusses, among other things, what Convolution is, how it extracts data from pictures, and CNN's architecture and components in the following section. This will demonstrate how CNN processes data and examines an image's content to deliver the intended outcome.

C. Architectural Overview

Convolution is a mathematical procedure that creates a third function from two functions, showing how one function's shape affects the shape of the other. The Convolution process necessitates the calculation and initialization of the Result function in order to complete theoperation. In order to assist Machine Learning and ultimately generate the desired Output through the algorithm, convolution is a data processing technique that entails categorizing the components (content) of an image. Picture data processing makes use of it. There are two distinct types of neural networks that are capable of analyzing image data: Deep Learning and Neural

Networks. Data-driven learningis made possible by a type of neural network called Deep Learning. The convolution process, as indicated by its name, separates the wheatfrom the chaff.
A three-dimensional volume of neurons in a cellular environment can be compared to this structure. The ability of CNNs to increase computational efficiency through the incorporation of novel layer types into their design is one distinctive trait that sets them apart fromearlier feed-forward versions. Let's take a closer look at how CNNs are designed in general right now.4]

D. Basic CNN components

1. Convolutional Layer:

CNN, or convolutional neural network, is a kind of neural network model that is designed for dealing with two-dimensionalimage data, although it may also be used to deal with one- dimensional and three-dimensional data. Convolution isaccomplished via the use of a channel (a small matrix whose sizemay be chosen). In this channel, which travels the whole picture network, the task is to reproduce the image's features by utilizing the pixel values that were first used. Each of these increases is added together to form a single number towards the end of the process. When doing a comparison action, the channel moves rightward by n units (this number may vary). After traversing overeach place, a framework is produced that is much less in size thanthe information grid that was previously constructed. [7]
Edge Detection Example:

In Figures 4 and 5 below, to detect the horizontal and vertical images with the help of a matrix, let's consider a greyscale image,with a6 x 6 matrix and a filter of 3x3 applied to it.[14]

After the above calculations of the matrix, we get the matrix as shown in fig:6. To calculate it, we take the initial 3 X 3 frameworkfrom the6 X 6 picture and increase it with the channel. Let’s consider the following matrix of 4x4 order and the calculation takes place as: for example, 3*1 + 0 + 1*-1 + 1*1 + 5*0 + 8*-1 +2*1 + 7*0 + 2*-1 = - 5. To compute the second component of the4 X 4 order, we will movethe channel one step ahead to the rightside of the original Greyscale matrix and so on: [14]

The way to detect the vertical edge in the image is to look for thepixel values as, if the pixel values are greater, then brightness at that partof the image will be more, and if the value is less, it willbe dark. [14]

2. Pooling Layer:

Spatial pooling (alternatively referred to as subsampling or down sampling) lowers the dimensionality of each element map while preserving the most critical data. Spatial pooling may occurin a number of ways: Quantifiers include the terms maximum, average, and total. If Max Pooling occurs, we define a spatial neighborhood (for example, a 22-window neighborhood) and choose the biggest component from the redressed highlight map contained inside that neighborhood. Rather than choosing the biggest component, we mightchoose the average (Average Pooling) or a total of all components included inside that window.Max Pooling has been shown to be increasingly effective with time. [8] Max pooling, as shown below, chooses the component with the largest size from the rectified featuremap. Choosing the biggest component is equal to using the conventional pooling method. The phrase "sum pooling" refers to the gatheringof all components in an element map. [8]

3. Fully Connected Layers:

Fully Linked layers have every neuron in the layer above it connected to every neuron in the layer below it. To put it simply, FC worksin the same manner as a conventional neural network, such as a Multi-Layer Perceptron, does (MLP). The main distinction is that information sources would be molded and organized in the manner defined by earlier phases of a CNN, ratherthan the other way around. [7].As illustrated in the diagram below,the feature map matrix is converted into a vector as(x1,x2,...xn) byutilizing the FC layer, and the resulting vectors are merged to create a model. Then, using the activation function, we can classify the Output into different categories.

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III APPLICATIONS

A. HealthCare:

Computer vision is extensively employed in the diagnosis of diseases by analyzing X-rays, magnetic resonance imaging (MRI),and othermedical pictures. It has been shown to be just as convincing as traditional human specialists in the area when it comes to accuracy. On a regular basis, Computer Vision is effectively diagnosing pneumonia, cerebrum tumor's, diabetes, Parkinson's illness, malignant uterine growth, and a host of other medical issues, and the technology is getting more advanced. Withthe use of best-in-class image processing technology and computer vision methods, early identification of any potential diseases will be feasible. In this manner, treatment may be administered at an inconvenient time during the disease or, in anyevent, the likelihood of their recurring is decreased [2].

B. Automobile:

With the expanded publicity of oneself driving autos, car businesses are vigorously subject to Computer Vision since it is intended forunderstanding the driving condition, including identifying impediments, people on footpaths, and conceivable crash ways. Self-driving autos are gradually advancing into the market, with more organizations searching for imaginative approaches to bring progressively electric vehicles onto the street.Computer Vision innovation enables these self-driving vehicles 'tosee' the earth while AI calculations makethe "minds" that help thatComputer Vision translate the items around the vehicle. Self- driving autos are furnished with numerous camerasto give a total360-degree perspective on nature inside the scope of several meters. Tesla vehicles, for example, utilize something like 8 encompasses cameras to accomplish this accomplishment. Twelveultrasonic sensors for identifying hard and delicate articles out andaboutand a front-oriented radar that empowers the identification of different vehicles even through downpour or mist are additionally introducedto supplement the cameras. With a lot of information being encouraged into the vehicle, a basic PC won't be sufficient to deal with the inundation of data. This is the reasonall self-driving autos have a locally available PC with Computer Vision highlights made through AI. The cameras and sensors are entrusted to both recognize and group protests in nature - like people on foot. The area, thickness, shape, andprofundity of the items must be considered quickly to empower the remainder of thedriving framework to settle on proper choices. Everyone of thesecalculations is just conceivable through the incorporation of AI and deep neural systems, which results in highlights like the person on foot recognition [15].

C. Astronomy:

Our full understanding of the universe is based on photon estimations, which are mostly composed of pictures of the universe. This opens the door to the potential of utilizing Computer Vision in astronomy since our universe is so enormous,and our universe's lone naturalrule predicts that the data gatheredwill be just as large. It will be impossible for the stargazer, or for anybody else, to physically contemplatethis information in its entirety. We can decipher all of the data in a short period of time,thanks to Computer Vision. To put it another way,computer visionis currently being utilized to find new planets and big bodies, withapplications such as exoplanet imaging, star and cosmicsystem grouping, and other similar tasks [3].

D. Industrial:

Computer vision is used in factories on mechanical production systems to check groups, find damaged parts, and look at finished goods.In this case, machines that use machine vision can help find tiny differences between things that can't be seen by humans. Because they provide a unique, recognizable proof to an item, reading scanner tags or QR codes are essential in assembly projects. People find it difficultto go through a large number of standard identifications in a single day; likewise, Computer Vision [3] may very well enable it to be accomplished efficiently in a matter of minutes.

IV ConvNet ARCHITECTURE

Convolutional Neural Networks (CNNs) is a kind of neural network that has been around since the mid-90s. You'll discover some more visually arresting designs in the section below [9].

A convolutional neural network was in the process of being created from the late 1990s to the middle of the 2010s, and it wasknown as LeNet during that time period. The tasks that convolutional neural networks were capable of doing grew increasingly fascinating as an ever-increasing quantity of information and processing power became accessible.

(2).AlexNet (2012) – In 2012, Alex Krizhevsky (together with others) published AlexNet, which was a more in-depth and much more complete version of the LeNet. AlexNet was the clear winnerof the inaugural ImageNet Large Scale Visual Recognition Challenge (ILSVRC) in 2012, outperforming the competition bya wide margin. This research represented a major advancement over prior techniques, and the widespread use of CNNs today maybe linked back to the findings of this study.

A Convolutional Network created by Matthew Zeiler and Rob Fergus was presented at the ILSVRC 2013 as part of the 3.ZF Net(2013) session. The ZDNet was the moniker that was given to thisnetwork (short for Zeiler and Fergus Net). It was feasible to makeimprovementsto AlexNet by altering the design hyperparameters used in its creation. When Szegedy and colleagues from Google presented a Convolutional Network at the ILSVRC 2014 conference, it was given the moniker "GoogleLeNet" (2014). Thisorganization's main goalwas the creation of an Inception Modulethat significantly decreased the number of parameters in the system (4M, contrasted with AlexNetwith 60M).

In the 2014 International Laser Scanning and Vision Research Conference (ILSVRC), a system that became known as the VGGNet was the first to cross the finish line. In particular, it aimedat demonstrating how important it is for efficient execution to havea system with sufficient depth (i.e., layers). It was ResNets (2015),a Residual Network created by Kaiming He (and others), that wasawarded sixth place in the ILSVRC 2015. ResNets (2015) was thewinner of the ILSVRC 2015. Convolutional Neural Networkmodels such as ResNets are currently by a wide margin the best- in-class models, and they will continue to be the default option forutilizing ConvNets for the foreseeable future (as of May 2016).

The seventh source is DenseNet, which was launched in August 2016. A network of nodes that are closely packed together. This denselylinked convolutional network, developed by Gao Huang (and others) and published recently, has each layer directly connected to every other layer in a feed-forward architecture, witheach layer being straightforwardly correlated with each other layer. Following the completion of five highly concentrated article acknowledgment benchmark assignments, the DenseNet was found to have gained substantial gains over prior best-in-class architectures, results revealed. View this video to see exactly howthe Torch was carried out.

V. CONCLUSION

We started the paper by going over an overview of deep learning and how neural networks are used in deep learning to process different inputs to get the desired outputs. The author has emphasized the Convolutional Neural Network in the concluding section, providing an in-depth explanation of a convolution operation, the system architecture of the CNN, and the coordinated operation of the layers of the CNN to identify an image's highlights and patterns. The author has described how these algorithms can be used to apply CNN to a variety of industries. The conclusion that can be drawn from this paper is that CNN has evolved into a very potent machine learning tool. During the machine learning phase, providing a variety of images as input data can speed up the learning process and allowfor multiple-output functions, which is a major benefit of CNN. The author mentioned in the preceding section that CNN is also being considered for IoT, commercial, and domestic security systems in addition to the application. As a result, CNN has risen to prominence in data engineering and continues to rise.

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A Smart Chatbot Architecture based NLP and Machinelearning for health care assistance.

ABSTRACT

Software that can converse with a human through natural language is known as a chatbot or conversational agent. One of the fundamental errands in computerized reasoning and regular language handling is the demonstrating of discussion. Starting from the start of man-made consciousness, its been the hardest test to make a decent chatbot. Despite the fact that chatbots can perform many errands, the essential capability they need to play is to grasp the expressions of people and to suitably answer them. For the construction of chatbot architectures in the past, simple statistic methods or handwritten templates and rules were utilized. Around 2015, end-to-end neural networks replaced these models due to improved learning capabilities. The encoder-decoder recurrent model is currently prevailing in conversation modeling. The neural machine translation domain saw excellent performance from this architecture. Up until this point, a plethora of new features and variants have significantly improved chatbots' conversational capabilities.

We conducted a comprehensive literature review in this paper. We looked at a lot of publications about chatbots from the past five years. After that, we presented a number of works that are related to our topic as well as the AI concepts that are required to construct an intelligent conversational agent based on deep learning models. Finally, we presented a functional architecture that we propose to construct an intelligent chatbot that can provide assistance with health care.

Keywords
Chatbots, artificial intelligence, conversational agents, modelingof conversations, natural language, neural machine translation.

1. INTRODUCTION

Software agents that use text or voice messages to imitate human conversation are referred to as chatbots or chatter robots. Since its inception, one of Chatbot's primary objectives has been to resemble an intelligent human and make it difficult for others to comprehend their true nature. Their use has skyrocketed in recent years as a result of the proliferation of Chatbots with a variety of capabilities and architectures [11].

These conversational agents have the ability to deceive users into thinking they are conversing with a real person, but they have very little capacity to expand their knowledge base during operation.

The chatbot makes use of artificial intelligence and deep learning techniques in order to comprehend the user input and provide a meaningful response. In addition, they communicate with humans via natural language in a variety of chatbot applications, including call centers, medical chatbots, and others.

Patients, nurses, doctors, and their families could all benefit from a chatbot. Better association of patient data, prescription administration, helping in crises or with emergency treatment, offering an answer for shallow clinical issues: All of these scenarios present opportunities for chatbots to assist medical professionals and ease their workloads.

2. RELATED WORKS

The mean examination points in regular language handling (NLP) are client expectation ID and Data extraction. Numerous models have been presented by researchers in the past. Self-learning chatbots have benefited greatly from recent advances in artificial intelligence, particularly deep learning and deep neural network models. Deep learning concepts like deep neural networks (DNN), recurrent neural networks (RNN), and convolutional neural networks (CNN) have been used in a number of attempts to address the seq2seq model issues.

Wu and.Al. (2017) looked into the issue of retrieval-based chatbots' answer selection for lengthy conversations. Matching a response candidate to the context of a conversation is the objective here; the challenge is to identify significant aspects of the context and apply the relationships between speeches in this context. The matching techniques that as of now exist could lose significant data in settings. Before matching, the context is transformed into a fixed-length vector without any interaction with the answer, according to the authors' unifying framework. A sequential matching framework (SMF) is the name of this new framework; it can enough take huge data from the settings to match the relations between addresses. SMF matches a response and creates a matching vector by matching the two. After that, an RNN is used to gather the matching vectors. The context-response matching calculation is the final step.

3. SIMILAR CHATBOTS

3.1 Casper: Helping Insomniacs pass theNight

By definition, insomnia is a type of sleep disorder. People who suffer from insomnia have trouble falling asleep; The American Psychiatric Association (APA) states that it is the most prevalent sleep disorder [3].According to the APA, insomnia affects approximately 30% of adults. However, between 5% and 10% exhibit symptoms that are severe enough to warrant an insomnia diagnosis.

Casper, also known as the Insomnobot-3000, arrives in the middle of the night to provide company.

It is the only bot in the world that can talk to you from 12 p.m. to 4 a.m., when you're having trouble sleeping and all of your friends have already turned off their phones for the night. The bot was created to replicate human-to-human conversation, so you can talk about almost anything with it.

3.2 Babylon Health

The name comes from the nearly 2500-year-old city of Babylon, where people who need medical help gather in the middle of the town to share information about common disease treatments.

Babylon Health Chatbot, which was established in 2013 and is currently valued at more than $2 billion, is here to perform nearly the same function in the 21st century. If the patient requires it, the company provides a video chat consultation with a real doctor as well as an AI-based consultation based on the patient's medical history and common medical knowledge [4].

For the first case, users describe the symptoms of their illness to the chatbot, who then uses speech recognition and a database of diseases to compare with and suggest appropriate actions. The second scenario already goes beyond the standard functions of a chatbot. It involves having a direct conversation with a real doctor who carefully listens to the patient and makes a diagnosis before writing a prescription or sending the patient to a specialist if necessary.

The UK's National Health Service (NHS) began utilizing the chatbot in 2017 for a trial period. Today, the company has grown even more because it offers online doctor consultations to NHS patients near London and Birmingham (over 700,000 so far) [4].

4. CHATBOTS & IA CONCEPTS

4.1 How a chatbot works

The most crucial step in creating a chatbot is choosing the right engine for natural language processing (NLP) [6].For instance, if you speak into the chatbot, it will need a speech recognition engine to turn your voice into text.

Programmers must also decide whether they want conversations that are structured or unstructured. Highly scripted chatbots designed for structured conversations reduce the number of questions a user can ask while simplifying programming. Because of the use of artificial intelligence (AI) technologies like deep learning, natural language processing, and machine learning (ML) algorithms, chatbots have evolved significantly over time. However, accurate results can only be achieved with a large amount of data. The bot's precision improves as you interact with it more.

4.2 The Limitations of chatbots

There are a lot of studies trying to develop such an amazing chatbot that will perform natural conversation and which will be indistinguishable from humans. But it is not possible to create such a chatbot. From the previous studies, the following are the major drawbacks in achieving effective and efficient conversationwith a chatbot.

- **Fixed Rule-based:** Existing chatbots are developed by usingstraightforward machine learning techniques, fixed set of rules, and matching based on templates [10].
- **Grammatical Errors**: Grammar mistakes cannot be recognized.
- **Predefined or Closed-domain:** previous studies show that most of the chatbots only answer the questions from a closeddomain, or answer those questions, which are defined in thedatabase.
- **Ambiguity:** The meaning or the context of a sentence is notapparent or has not any appropriate purpose
- **Language Structure:** The structure of sentence making differ from language to language. For example, each language has its own rules for punctuation, text structure, and use of spaces. While existing chatbots cannot distinguishit.
- **Semantics:** It means words or sentences in a human naturallanguage format. The current chatbots cannot handle naturallanguage processing whether these chatbots only show a response, or they make the analysis of questions.
- **Sentiment Analysis:** The previous chatbots cannot identifythe emotions of any subject about which human talks. A chatbot should be capable of identifying whether a human ishappy, sad, or angry from the way any speech or text patternis presented to it.
- **Recommender Systems:** The previous chatbots are not ableto advise or explain any human topic. Even they cannot askany questions. Chatbots only gather information from the user and generate a response from the knowledge base. A chatbot must be able to create queries based on previously answered questions [9].
- **Accuracy:** The chatbots should be designed in such a way that their conversation is like a human to complete any task.But existing chatbots are bad at suddenly changing any subject and provide an unpredictable response. Sometimes chatbots respond without any context. Thus, we cannot achieve a satisfactory level of accuracy.
- **Self-learning:** Supervised machine learning techniques are not used in previous chatbots. They are bad at learning the latest patterns of words or speech. They cannot discover context from logical reasoning and interaction. Most of the chatbots cannot train any classifier to map from the sentenceto the intent and sequence model to the slot filter.
- **Support Third-party Integration:** The current chatbots cannot support third-party integration, for example,knowledge-based, and they do not support multiplelanguages.
- A large number of chatbots only support the English language. It is challenging to embed them on any web page because of tough and challenging integration.
- **Data Processing:** The existing chatbots do not directlyprocess the structured data, and there is no relational database. Besides this, datasets are complicated to prepare, mapping of entities and utterances is critical.
- **User Interface:** The interface of existing chatbots is inadequate; it is not user-friendly, and documentation is alsoabysmal.

To overcome all the mentioned limitations, a new chatbot must be developed that possess all the deep learning capabilities. Withanalyzing human input, it will also be responsible for generating a proper response. If we train chatbots properly, they will quicklyand easily recognize the natural language of humans and will react adequately in each situation. But the major drawback is, to generate these innate responses a considerable amount of time and data required so that all huge amounts of possible inputs willbe learned. Training will prove if Artificial Intelligence chatbots are capable of handling more challenging problems that are a hurdle for the simpler chatbots.

4.3 Artificial intelligence concepts

Before few years, a computer could hardly think as the human brain do. But today, AI has changed everything we can now solve complicated problems easily. The fundamental technologies for chatbot are machine learning, natural language processing (NLP),and Artificial intelligence (AI). These technologies brought chatbot invention hereafter brands communication, to a completely new personalized level. Although chatbot solutions for business are mostly used in the industry of customer service, the technical giants such as IBM, Google, and Microsoft suggest that the true potential of chatbots still needs to be fully revealed.

AI provides many opportunities, as it includes such capabilities that allow the software to perform such tasks that humans

perform. Natural language processing is the foundation of AI- based chatbots. By using sophisticated algorithms of NLP, chatbots can process the input text: understand, conclude, and determine that what was said or written and then state a list of all suitable actions.

If there was no development in the field of NLP, chatbots had to be at the same spammy and awkward situation as they were at their beginning.

As displayed in Fig.1, we have three main concepts of Artificial intelligence, ASR , NLU and NLG that we will explain in the next section

NLP Natural Language Processing acts as a fundamentalpillar for recognition of language, which is used by Apple's Siri and Google. It allows technology to recognize human natural language text and speech-based commands and include two majorcomponents natural language generation (NLG) and natural language understanding (NLU).

Natural language understanding is more laborious than natural language generation, as the natural language has a remarkably rich structure and form. It maps the given input and analyzes multiplefeatures of the language.

NLU Natural Language Understanding is responsible for handling and converting formless data into a proper form that the system can easily understand [7].

NLP has further five main steps if we want that message shouldbe easily understandable by a chatbot. These steps are:

- Lexical analysis
- Syntactic analysis (parsing)
- Semantic analysis
- Discourse integration
- Pragmatic analysis

The lexical analysis: Includes analysis and identification of words structure; it splits the text into the chapters, then into sentences, phrases, and words.

Syntactic analyzer: Parsing analyzes grammar and arrangement of words so that the relation among different wordsbecome more explicit. Sentences like "the hospital go to the doctor," Are rejected by Syntactic analyzer.

Semantic Analysis: check that either the text is completely meaningful or not, and it draws its correct meaning while mapping syntactic constructions. The semantic analysis will reject the phrase like "cold fire".

Pragmatic analysis and discourse integration: analyze the concluding interpretation of the real message of the text. Such as the actual meaning of a phrase or a sentence relays on the overall context.

NLG Natural Language Generation involves text realization and text planning to generate an understandableresponse. In simple words, language generation is responsible for the formation of linguistically correct sentences and phrases.

The key challenge faced by NLP is to understand the complications of natural human language

The structure of language is itself very vague regarding syntax, lexis, and other components of speech such as similes andmetaphors. A single word can be taken as a noun or a verb; a single sentence can be passed in many different ways; moreover,a single input may have multiple meanings, etc.

ASR Automatic Speech Recognition comes under computational linguistics, which develops technologies and methodologies that enable the identification and translation of user speech into text with the help of computers. It is also calledcomputer speech recognition, automatic speech recognition (ASR), or speech to text (STT). It includes research and knowledge in electrical engineering, linguistics, and computer science fields.

5. PROPOSED ARCHITECTURE

As we can see in fig. 2 this is the proposed architecture for ourchatbot, and we will eplain every part of it in the next section.

1) Environment

The place where the fundamental Natural Learning Process(NLP) engine and context clarification occurs.

- **NLP Engine**

A fundamental component understands what any user says at a given time and then converts this language into well-defined inputthat can be further processed by the system. As chatbots are domain-specific so they should support multiple features. The natural language processing engine consists of the latestalgorithms of machine learning that are used to identify the intentof the user and then match them with the list of those intents thatare supported by the bots [8].

Components of NLP Engine:

Intent Classifier: It takes input from the user, interprets its meaning, and then relates it to that intent which is supported bythe chatbot**.**

Entity Extractor: It extracts the critical information from thequery of a user

- **Agent for Dialogue Management**

It can manage the real context of the user saying. For example: Ifa user said "He needs to call a heart specialist" and then chatbot should make the call. If the user then said that "Change my request to the chest specialist," here the user is referring to that demand, which he has requested earlier, the chatbot must interpretit correctly and should make changes before confirming from theuser side. For this purpose, dialogue management plugins are helpful.

Dialogue management further has following key plugins:

Feedback Mechanism: In this mechanism, an agent is responsible for taking the user's feedback from time to time to verify that either the bot is working correctly with the dialogues of the user or the user is satisfied with the Responses of the bot. This thing supports the chatbot to understand all the mistakes andto improve itself for future conversations.

Policy Learning: A framework enables the bot to take a maximum of happy paths from the conversation so that we may increase the satisfaction of the end-user. This higher-level framework creates a network that has happy paths, and then it directs the conversation to the satisfaction of the end-user. After this, the bot goes on learning from interaction and then it followsthat flow of communication, which it had in the past with anotheruser.the companies such as field worker and HR management chatbots.

4) Node Server / Traffic Server

A server that is responsible for handling the user's request and then route it to the suitable components. This server also directs the response of the internal component back to the front-end system.

5) Front-End Systems

Several systems that has a client-facing platform can be candidateto develop the frond-end. These systems can be the chatbot interfaces that exist in many platforms such as:

- Microsoft Teams
- Facebook
- Google Hangouts
- Slack
- Skype for Business

6. CONCLUSION

According to the scientific community, chatbots are user-friendlyand any person who has an awareness of typing in their languageon the desktop version and in the mobile application can use thesechatbots very easily.

The new development in artificial intelligence and the new waveof thinking have the potential to entirely change the experience ofcustomers to provide the best services in such a way that echoes with the modern customers. Especially in the field of medicine, amedical based chatbot offers a personalized analysis based upon symptoms. In the future, the recognition of the symptoms of botsand the performance of diagnosis will be highly improved with the addition of support for further medical features, such as symptoms intensity, duration, location, and a more detailed description of symptoms.

This study presents state of the art in this field, which open us to more exciting works in the future.

7. REFERENCES

2) Question and Answer System

It is a fundamental component to answer the users frequently asked questions. This system understands the user's questions properly and responds to those questions with the related answersstored in the knowledge base.

Manual Training: In this training, the domain experts create a list of frequently asked questions and then map the answers. This mechanism is helpful for the bot to recognize the answers tothe many important queries.

Automated Training: In this training, different types ofcompany documents such as Q&A documents and policy documents are submitted to the bot, and it is asked to train itself for these documents. This training results in a list of questions andanswers from these provided documents. This bot can answer allthese questions with full confidence.

3) Plugins/Components

Plugins provide smart chatbot automation components and chatbot solution APIs for those chatbots which are used inside of

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BIOMETRICS AND PRIVACY - ISSUES AND CHALLENGES

ABSTRACT

The use of biometric technologies and systems is expanding significantly in both the public and private sectors. Examples of biometrics innovations that are becoming less expensive, more advanced, and more precise include facial recognition, voice recognition, unique finger impressions, and iris checking. As a result, people's interactions with the government and daily lives are becoming more ingrained.

This resource goes into great detail about biometrics, the benefits and applications of biometrics in the public sector, as well as the privacy concerns that biometric systems raise. In addition, it examines the connection between biometrics and the Information Privacy Principles (IPPs) of the PDP Act.

INTRODUCTION

"Biometrics" refers to a wide range of technologies that use probabilistic matching to identify an individual based on their biometric features. Conduct credits, such as a person's step, mark, or keystroke design, or physiological elements, such as a person's finger impression, iris, or face or hand calculation, are examples of biometric qualities.

Compared to token-based systems like ID cards or licenses or knowledge-based verification systems like passwords or PINs, biometric characteristics typically perform unique identity verification more effectively and reliably.

Biometrics are increasingly being used in identity management, particularly for authentication, which is the process of confirming a person's identity. This is because biometric attributes cannot be shared, lost, or duplicated as easily as passwords or tokens can.

HOW ARE BIOMETRICS USED?

Authentication

Utilizing biometrics to confirm a person's identity is common practice. Two examples of this are smartphone access via fingerprint or facial recognition and the use of facial recognition technology at smart airport gates. Utilizing biometrics, the method of authenticating individuals is known as one-to-one matching.

In one-to-one (1:1) biometric systems, a person's biometric characteristic(s) are compared to the system's existing data. The individual has already provided their biometric information for use in subsequent authentication in this instance.

Before comparing it to biometric data that is already stored in a database, the majority of biometric authentication systems require the user to actively provide their biometric characteristic. In any case, verification can also take place in the background without ever involving the individual.

Instead, when someone uses a business or service, their biometric information is automatically gathered and checked. A customer service representative might, for instance, take a person's voice biometric while they are on the phone and verify it.

Utilizing behavioural biometrics for passive authentication is becoming more and more common, frequently as an additional security measure. As previously mentioned, this entails measuring and tracking patterns in an individual's physical movement, behaviour, or use. This could include how someone holds and moves a phone or other device, as well as how hard they tap the screen with their fingers. A person's language, including their choice of words, grammar, and sentence structure, is a biometric trait that can be measured.

Identification

Another kind of biometric system is one-to-many biometric systems.1:N) system, which is used to identify people frequently. One of the goals of one-to-many systems is to possibly find a match and thus identify the individual. This involves contrasting an unidentified person's biometric characteristic with other characteristics of the same type stored in a database (such as the person's fingerprint with other database fingerprints). A match is not always guaranteed because the individual's biometric information may or may not be in the database.

One example of a one-to-many biometric system is the application of facial recognition technology to the process of locating an individual in a crowd. One-to-many systems are also frequently used in law enforcement to match a victim's or perpetrator's DNA to other samples in a database.

With other technologies, biometric systems can be used for more than just identification and authentication. In addition to allowing for the identification of an individual, facial recognition technology, for instance, can also be used for monitoring or surveillance. A network of CCTV cameras, for instance, can be used to follow a person as they move through an environment after they have been identified. While artificial intelligence is occasionally utilized for recognition, the majority of biometric systems are automated.

HOW DO BIOMETRIC SYSTEMS WORK?

A individual's biometric data is initially entered into a biometric system at an argument recognized as enrolment. During the enrolment process, a characteristic is collected to serve as biometric reference information for that individual. Raw data, such as an image of a fingerprint, or digital templates can be recorded with this data. In a computerized layout, key biometric trademark components are separated and handled to create the layout, which is stored in a data set for later use.

When biometric data are later presented, a process known as recognition occurs: A person's characteristic is discovered, key features are extracted, and the person is compared to existing database templates in order to either authenticate or identify them.

The majority of biometric systems only save the pattern, not the real copy of the biometric. However, in some instances, the real pictures of enrolment characteristics, such as fingerprint images, may also be preserved. Despite the fact that some operators believe this is necessary in the event that re-verification is required in the future, there are risks associated with it, as will be discussed in greater detail later in this paper.

The recognition engine model in question and the biometric solution's templates are typically unique to that solution. A template created by a manufacturer's biometric engine will not be recognized by a system produced by a different vendor. It's possible that a subsequent version of a software company won't always be able to read a template fashioned by an previous version.

Therefore, the risk of storing templates is much lower than that of storing the raw biometric characteristic, such as an image of a fingerprint. Despite the slightly lower risk, templates should still be encrypted.

Wherever raw biometric images are stored, security controls must be in place and regularly monitored and audited. Businesses should also consider whether they want to be the target of criminals looking for biometric data that could be used for identity theft.

Limitations of biometric systems

Even though biometric systems are getting better as technology gets better, they are not a foolproof way to identify or verify someone. Some of the disadvantages of biometric systems are listed below.

Wrong acceptance and refusal rates

Biometric systems can make two fundamental mistakes. The organization flops to identify a match between an input and a matching template in a "false positive," while the system incorrectly matches an input to a non-matching template in a "false negative."

Errors like these can occur in a biometric system for a variety of reasons. Between the enrolment and recognition stages, a person's biometric characteristic can also change as a result of age, injury, or medical conditions. For instance, it may be challenging to distinguish identical twins based on their facial biometrics, or distinct individuals may possess similar biometric characteristics but posing differently.

A biometric system's template is matched to an individual through probabilistic calculations. The margins of error can be affected by the individual's lighting or posture at the time of enrolment or subsequent identification, as well as the racial or age characteristics of the sample data used to train the system. Any biometric solution needs to focus on lowering the number of false positives and false negatives.

Spoofing

While biometric identification does have some benefits for identity management, it is not a foolproof strategy for preventing identity theft or fraud. Like other security measures, biometrics use has vulnerabilities and the potential to be hacked. Fake artifacts, like a copy of a biometric characteristic, can sometimes fool a biometric sensor. The practice of spoofing is a threat to the safety of biometric systems. Due to the fact that computer vision functions in a manner that is distinct from human vision, some of the spoofing techniques may at times appear counterintuitive.

A lot of biometric systems use liveness detection to try to stop spoofing. To determine whether a biometric sample comes from a real person or a fake one, a technique known as "liveness detection" is used. It could be used, for instance, to distinguish between a face-printed 2D or 3D object and a live image. Even with liveness detection, a biometric solution may still be susceptible to adversarial attack.

Compromised biometrics

In contrast to passwords and ID tokens, which are also limitations of biometric systems, biometric characteristics cannot be reissued or cancelled. It could be very troublesome, in the event that certainly feasible, to change an individual's unique mark or some other physiological biometric that has been compromised. This might be a problem in the future if that biometric property is going to be used for authentication.

A portion of these issues and impediments of current biometric frameworks might be tended to by additional improvements in liveness discovery and cancellable biometrics, given the developing idea of biometrics.

BIOMETRICS IN THE PUBLIC SECTOR

Biometric authentication and verification may be beneficial to the public sector, particularly in the area of identity management. Because they have the potential to be an effective and dependable method of authenticating individuals' identities, biometrics are utilized in a wide range of settings and industries, including workplaces, payment and financial services, and law enforcement. Biometrics can, in some instances, provide a higher level of security than other methods of access control, such as swipe cards or passwords. This can also help to improve privacy.

Implementing biometric systems may also improve the efficiency of government procedures. An actual illustration of this is the facial recognition technology used in smart entryways at international airports; Immigration and border officials are no longer necessary for entry into a country. All things being equal, they can go through the most common way of getting in. Voice recognition technology has also been used to verify individuals' identities over the phone to gain access to government services.

In the digital and information age, as the preceding examples demonstrate, biometrics present numerous advantages and opportunities for public sector organizations to achieve their objectives in novel and creative ways. However, privacy, particularly information privacy, is also affected.

PRIVACY CHALLENGES

Biometrics, like many other technologies, can jeopardize privacy. However, it is essential to remember that biometrics are not anti-privacy by nature; The degree to which biometrics enhance or compromise individuals' security is determined by the planning and application of frameworks. A portion of the security benefits that could result from using biometrics are immediately recorded.

Function creep

When data is used for something other than what it was intended for, function creep occurs. This becomes a concern when the individual is not informed of the secondary use prior to providing their information.

An organization might, for instance, collect the facial biometric information of an employee in order to grant access to a building. After that, that data might be used for something completely unrelated, like tracking when an employee starts and finishes work.

Covert collection

Another privacy risk is the covert or passive collection of biometric data without a person's consent, participation, or knowledge. For instance, photos that people are not aware are being taken can be used to collect facial biometric data, and dormant fingerprints can be lifted to collect biometric data long after an individual has connected with a hard surface.

This risk increases even more as technologies become more sophisticated and effective at hiding or capturing biometric data.

Secondary information

Some biometric characteristics may reveal additional information about an individual beyond the purpose for which the biometric was initially collected, depending on the characteristic and the storage method (raw data or a template).For instance, a raw image of a facial biometric could show health information that a person did not want or consent to be collected.

Consent

Biometrics also raise questions about consent. In the context of information privacy, consent is typically based on a transactional model, which asserts that individuals can choose how their personal information is used and collected.

If the group of biometric info is covert or passive, individuals may not be able to give their consent or exercise control over what biometric information is collected or how it is used. At the point when individuals are expected to partake in a biometric framework, for example, when it is utilized as a safety effort to confirm representatives in a working environment climate, the capacity to give significant assent is likewise restricted. These frameworks may likewise be dependent upon lawful limitations notwithstanding security concerns.

Consent is another issue that biometrics raises. Consent is typically based on a transactional model, which asserts that individuals can choose how their personal information is used and collected in the context of information privacy.

On the off chance that the assortment of biometric data is incognito or detached, people will be unable to give their assent or exercise command over what biometric data is gathered or the way things are utilized. The capacity to give significant consent is also limited when people are expected to participate in a biometric system, for example, when it is used as a safety measure to verify representatives in a working environment. In addition, these frameworks may be based on legal restrictions and security concerns.

Other challenges

Biometric enrolment and verification can be time-consuming and require multiple steps in a new system. When using a system for the first time, the procedures may be difficult to understand or ambiguous. It's possible that not everyone will like these.

People's identities may be affected in ways that go beyond just identification and authentication as a result of the growing use of biometrics. Reduce an individual's unique and innate biometric characteristics to a template because it can affect how they develop their sense of self and how they relate to other people. This could be considered dehumanizing.

SENSITIVE AND DELICATE INFORMATION

Privacy laws in different parts of Australia define the terms "sensitive information" and "personal information" in different ways. For instance, biometric data, including biometric templates, are regarded as sensitive data under the federal Privacy Act of 1988 and are subject to enhanced collection and use safeguards.

BIOMETRICS AND THE INFORMATION PRIVACY PRINCIPLES

Because the operation of a biometric system will likely involve interaction with the PDP Act, it is essential to consider the IPPs when implementing and implementing biometric systems. In addition to meeting legal obligations under the PDP Act, taking into account the IPPs will aid in the construction of a robust system that the user group and the general public can trust.

In the following section, we'll go over how some of the IPPs and biometric systems interact.

IPP 1 – Collection

Necessity

An organization is only required to collect personal information in accordance with IPP 1.1 of the PDP Act in order to carry out one or more of its functions. The collection of biometric data and the use of biometric systems in general should only be done when absolutely necessary for an organization's operation. As a result, having a distinct purpose for the use of biometric systems is essential. In addition, it is crucial to ensure that the organization possesses the authority to collect this information, either under the PDP Act or other legislation.

Fair and not unreasonably intrusive

Biometric data should be collected fairly and without unreasonable intrusion, as stated in IPP 1.2.Biometrics have the potential to invade a person's privacy based on the technology and system used, as well as the setting in which they are used. Biometrics, on the other hand, can make privacy better. It might be appropriate, for instance, to enter a high-security facility through iris scanning; However, it probably wouldn't be right to use it to enter a school or library. The biometric system that is selected ought to be the least intrusive to a person's privacy, but this will be contingent on the various contexts and purposes for which it will be utilized.

Notice

Depending on the circumstances, organizations may be required to inform users of the collection of biometric information (IPP 1.3). This includes disclosing to individuals the purposes for which biometric information is gathered, the consequences of withholding the data, and the parties to whom it may be disclosed.

IPP 2 – Use and Disclosure

Similar to other types of personal data, biometric data should be used and disclosed in accordance with relevant legislation, such as IPP 2 of the PDP Act and other applicable laws.

Under IPP 2, the use and disclosure of personal information are restricted to ensure that it is only used for legitimate purposes. Biometric information should only be used or disclosed for the primary purpose for which it was collected, unless an exception applies. For instance, fingerprint biometrics that are collected for the purpose of controlling access into and out of a building should not be used for any other purpose, such as tracking the movements of those individuals. Instead, they should be used exclusively for that purpose.

By being clear about the intended uses or disclosures of biometric information, function creep can be reduced. As per IPP 1.3, people ought to be educated regarding these purposes when they pursue an assortment notice.

IPP 3 – Data Quality

Businesses must ensure that the personal information they hold is accurate, complete, and up-to-date in accordance with IPP 3.Data quality is particularly critical at the enrolment stage, as the idea of a biometric test will effect on the precision and practicality of the biometric structure. For instance, a biometric sample of poor quality at enrolment can make it more likely that subsequent authentication or identification presentations will result in false acceptance or rejection.

IPP 4 – Data Security

Reasonable steps to protect personal information

Biometric information security is crucial because of its inherent fragility. Unlike ID tokens and passwords, a person's biometric characteristics cannot be easily altered.

In accordance with IPP 4, Victoria's public sector (VPS) organizations are required to take reasonable precautions to protect the personal information they hold, including biometric data, from misuse, loss, and unauthorised access, modification, or disclosure.

Before hiring contracted service providers (CSPs) to implement or manage biometric systems, businesses should verify that the security practices of third parties comply with legal requirements. According to Part 4 of the PDP Act, the outsourcing VPS organization is always responsible for any data security breaches that may occur in relation to the services provided under the outsourcing arrangement. This is true even if the data security breaches are the result of the CSP's actions or practices.

Destruction

In accordance with IPP 4.2, personal information should be permanently de-identified or destroyed when no longer needed. For example, if a VPS company uses a biometric system to verify staff members' access to its offices, the company should make sure there is a disenrollment procedure in place to get rid of the employee's biometric information when they leave.

When biometric data is destroyed, it is necessary to adhere to all relevant recordkeeping obligations, such as the Retention and Disposal Authorities of the Public Record Act of 1973.

BIOMETRICS INSTITUTE PRIVACY GUIDELINES

The Biometrics Institute, a global user group, works to encourage the ethical use of biometrics. It has produced best practices guidelines to assist businesses considering biometric systems. The proportionality, accountability, concern for people's safety, and truth and precision in business activities are among the 16 core values outlined in the 2019 Biometrics Foundation Security Rules.

Even though the guidelines do not specifically address the IPPs, they still provide a useful list of guiding principles that businesses considering using biometrics might find helpful.

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Comparative Research of AR and VR TechnologyBased on User Experience

Abstract:

One of the most important areas of research in the current field of information technology is the study of augmented reality and virtual reality. These dual technologies have been implemented in a diversity of arenas, including education, medical care, construction, military activities, entertainment, and construction. At the similar time, research on the technical level is getting better; however, research on the evaluation of these two technologies and the development of an optimization program based on the user experience is quite unanticipated. The real estate exhibition serves as the starting point for this study. It then conducts comparative experiments with AR and VR technology in the real estate display field, selects the appropriate evaluation index and quantifies the method, conducts a relative examination of VR and AR technology's evaluation effects, and then constructs a user experience evaluation model.
Keywords: augmented reality, virtual reality, user experience

Introduction

Human-computer interaction technology has been widely used thanks to the rapid growth of computer science. Virtual reality and augmented reality technology are also important application areas. Instead of the traditional human-machine interface or windows, virtual reality (VR) integrates three-dimensional computer graphics technology, sensing technology, artificial intelligence technology, and so on. The term "virtual reality" refers to the direct immersion of observers in the computer-generated three-dimensional world .Using computer graphics and display technology, Augmented Reality (AR) can "place" virtual objects accurately into the real environment using sensing technology, which can successfully fuse the virtual and real objects through some related equipment, achieving the information integration of the real and virtual worlds and bringing a kind of real-time interaction to observers. It develops on the basis of VR technology.AR supported by the Fundamental Research Funds for Central Universities (106112013CDJSK030003) and VR supported by the Fundamental Research Funds for Central Universities (CDJXSII031123) are widely utilized in a variety of fields, including education, medical care, construction, military affairs, entertainment, and other fields. The application service of these two technologies is quite diverse in various fields, and the information service is emerging on a large scale. Information service providers are expected to provide a high-quality user experience in order to win over the target market and earn customer loyalty. This paper chooses some evaluation index and quantitative methods and conducts comparative experiment research on the application of AR and VR technology in the real estate exhibition field based on the user experience (UX) angle. Finally, this paper compares and contrasts the evaluation results of augmented reality (AR) and virtual reality (VR) and develops a user experience evaluation model for both skills used in real estate display.

Literature review

The term "user experience" is defined by the standard ISO 9241-210 and its supplementary instruction as "all feelings of users before, during, and after using a product or system," which includes the domains of emotion, faith, fondness, cognitive impression, physiological and psychological reaction, behavior, and achievement, among others. Additionally, three factors that influence the user experience are listed in the supplementary instruction: environment, user, and system, System factor can be divided into two directions—design feature and user define—as well as three layers—service layer, application layer, and network layer—to conclude various elements. Every course or layer can likewise be separated into quantifiable or subjective explicit components [5l.Time has an effect on user experience; It brings an end to the entire procedure, from the anticipation before the experience to the comprehensive review after the experience [6l].There are three primary ways to quantify the quality of the user experience in order to measure its effects: There are two kinds of law: "Paired Comparisons"[7l] and the widely used "Mean Opinion Score" (MOS) that the International Telecommunication Union (JTU)l9l recommends. After quantification, we

can use statistics, psychology, and artificial intelligence to assess the user experience's quality and the result of subjective, objective, or a combination of subjective and objective thinking[i01].

VR technology has two characteristics: on the one hand, it is a cross-disciplinary team. The research on VR technology's effects on modeling, drawing, and human-computer interaction, among other areas, must combine findings from a variety of fields, including mathematics, physics, electronics, cybernetics, computer science, psychology, and artificial intelligence; On the other hand, virtual reality technology is very useful[ll].We mostly use desktop virtual reality systems for real estate exhibitions because they focus on solving technical issues like surrounding traffic conditions, environment, commercial facilities, and municipal facilities.
When creating a realistic virtual environment, technology can alleviate the stringent requirement for system calculating capability[i31].The availability evaluation, human factor analysis in AR, and the AR design and evaluation method currently dominate AR and user experience research. In the meantime, some academics have proposed that augmented reality can be used in real estate.

Developers Project location Design Style

completely outfitted room, by which we can advance the client experience [171.
In summary, there is a lot of research on the system and key technology of VR and AR technology. On the application level, most of the research is focused on education and tourism, but less is done on the user experience of these two technologies, especially comparison research. And this is one of the main reasons why some industries can't use virtual reality and augmented reality right now. At the same time, there are a lot of elements that affect the user experience. It's worth looking into how to divide these elements into layers, how they relate to one another, and how to experience or evaluate different products.

The analysis of the UX process
During the typical real estate exhibition phase, the area map, sand table, layout plan, model for an apartment layout, sample home, etc. are the key components of its content. Customers could only learn the relevant information from salespeople's vocal explanations, and the only way to gain user experience was by visiting a sample home.

Selection of quantitative methods and evaluation index
We found that the real estate display based on augmented reality (AR) technology uses the real environment as a carrier, and that the user replaces the sand table, layout plan, apartment layout model, decoration material, and furniture with virtual objects (words, pictures, video, audio, information model, etc.) and places them in the real environment.whereas the real estate display that is based on VR technology uses the new virtual environment as a carrier, similar to how a game environment lets you experience houses and the outdoors.This paper will use a unified evaluation index and a standard subjective evaluation standard to measure the convenience and information receiving frequency of these two systems because of their distinct user experience implications."i" refers to each function in each process in the utility value evaluation (Tab. 2), "t" to the behavior of each function, and "Sti" is the degree of experience that "i" brings, so there are mathematical formulas.

It is a kind of evaluation towards experience process by using the technical functions and utility value aspictures, video) Automatic roaming

Experimental study
By selecting the evaluation index and quantify method above, then we can through specific experiment to quantify and compare the AR and VR real estate display system, Specific implementation is as follows:

Firstly, get the finish time and process of each function by the group experiment. This paper chose the method of sampling in small-scale, and twenty-eight people participated who were divided into two groups, the age of them is range from twenty-nine to forty-six , having the intent of pursuing houses, and their cognition degrees about AR and VR technology are ahnost the same. The members of these two groups are all experiencing the AR and VR real estate display by the mobile equipment: ipad, meanwhile we set a better sales environment to reduce the influence towards operation process by the environment and other external factors. And record the operation process and time of operators by video. Then after each function has been achieved, operators are required to answer the questionnaire about satisfaction degree, emotion reaction and aesthetic reaction timely, so that we can record the operators' subjective experience feelings during the whole process. The operation processes are as figure 4 and figure 5.

The full mark of satisfaction degree is 100, the emotion reaction is also divided into 100 degrees(very pleasant after usage is 100, very disappointed after usage is 0), the aesthetic reaction is also divided into 100 degrees(feeling very concise after usage is 100, feeling very chaos after usage is 0); the weights of each function is defined by the fond degree of volunteers who participated in the experiment, the common functions are counted by 80%, uncommon functions are counted by 15%,and the personal use functions are counted by 5%. Finally we can get the statistical data.

Along with the sunrise of the AR/VR getting older, one of the procedures which social media sites service might potentially introduce in addition to keeping their viewers undamaged is with setting up AR modern-day technology. Snapchat jumped on the AR learn very early using providing various interactive picture filters, together with the Instagram following suit.
Recently, Snapchat released Shoppable AR, which allows users to test out brands' products through the use of a lens and then directs them to a store that can help them figure out where they should actually spend that money.On the VR side of qualities, virtual entertainment data like vTime,
Facebook Spaces, and so on permits equal electronic social earth to exist, which empowers a client to completely "leave" life's existence.
Moreover, Holoportation will positively make it feasible for device clients in various metropolitan spots or then again nations to rest as well as impart notwithstanding each other in an indistinguishable space essentially while proceeding to be kilometers.

The real estate display operation process based on AR
By the objective , quantified observation and calculation data, we can get the conclusion that: the information receiving frequency of AR real estate display system is generally higher than VR real estate display system, and the average information receiving frequency of various functions in AR real estate display system(CU, UC PC) is higher than that in VR real estate display system.
From the research data in the subjective quantification table, we can see that the average satisfaction and emotion feeling in AR real estate display system are generally higher than that in VR real estate display system, while the aesthetic sensibility of AR real estate display system is lower than YR.

Their application for the company is elegant, as is virtual reality. This significant influence may be attributed to AR's ability to deal with facts; better explained by referring to our actual solid world as a canvas on which augmented reality enables our company to take or even reveal facts; in addition to the capacity of virtual reality to launch our team and provide us with a blankcanvas on which to draw and enjoy our private information.
The following are a few notable AR/VR application areas:

1. Pc gaming and also Entertainment

2018 was the year that augmented reality (AR) development saw a significant uptick. This was largely due to the widespread acceptance of Pokémon Go, Apple's ARKit, and Google.com's ARCore. Before the 2018 charm representatives, Google.com Glass, Admission, and Snapchat were the three primary drivers of augmented reality's widespread adoption. In addition, a Silicon Valley-based company called Miracle Surge has recently developed a light-weight wearable AR and virtual reality glass that lets movies and television shows "explore the living room." This multipurpose home entertainment supplement can be used to play games, view movies, and perform organization-adapted tasks in the domain of AR and virtual reality.

In addition, various updates stations, educational stations, streaming services, and so on have pushed virtual reality internet content to target markets in an effort to gain a competitive advantage in the entertainment industry. Some businesses are also providing VR headsets to their customers so that they can watch product launches in virtual reality in order to better report the market and convince social assumption.
VR has similarly looked at adopting in a lot more common areas consisting of cinema (to allow VR cinemas which are visiting do without monitors a lot akin to noiseless discos) as well as in the adult show biz which is forecasted to end up being a predicted $1 billion sector through 2025.
Microsoft Hololens is currently partnering with the NFL to customize the procedure followers may see as well as socialize alongside players, different other lovers, real-time video game adventures in addition to its very own marketing experts in addition to supporters. Also, a few of the successful instances of bundled reality computer games on Android and additionally apple iPhone till day are SpecTrek, Access, Gbanga, along with Pokémon Go.

2. Social network
Along with the sunrise of the AR/VR getting older, one of the procedures which social media sites service might potentially introduce in addition to keeping their viewers undamaged is with setting up AR modern-day technology. Snapchat jumped on the AR learn very early using providing various interactive picture filters, together with the Instagram following suit.
Recently, Snapchat released Shoppable AR, which allows users to test out brands' products through the use of a lens and then directs them to a store that can help them figure out where they should actually spend that money. On the VR side of qualities, virtual entertainment data like vTime,
Facebook Spaces, and so on permits equal electronic social earth to exist, which empowers a client to completely "leave" life's existence.
In addition, Holoportation will make it possible for customers of gadgets in multiple countries or metropolitan areas to rest and communicate simultaneously in the same space, effectively across distances of kilometers.

Conclusions

Through the comparative research of AR and VR real estate display system, we find that the differences on realizing way fmally cause the differences on the functions which can be achieved in these two systems, and the distinct functions will affect the consequence of utility. The achievement of various functions in AR system is based on the real environment, so lots of its functions need to cooperate with the people as well as the objects in real environment, as for the subjective feeling, AR is a quite open system; while on the contrary, VR system needs to build a totally virtual environment, then achieve the functions on the base of it. The paper quantified the user experience from three factors the
classification of system function, the information receiving frequency and the subjective evaluation of users after using a product, and got the observation data by group experiment, then drew the conclusion that AR system is superior to VR system generally. Meanwhile, the paper also built the user experience model on the base of observation value and the result of subjective evaluation.
While, the building method of evaluation model and the selection method of index weight are not perfect enough, the selection of index weight in the paper is a kind of subjective, and it is supposed to be amended by using the coefficient of variation method; in addition, because the relationship between user experience degree and information receiving frequency is nonlinear, and the samples of group experiment in the paper are all small-scale, so the final function fitting later should use the support vector machine(SVM)l20J to consummate.
The key is just how rapidly and wisely our team can easily adjust, use and welcome these changes, which are going to mark our organization's as well as our customers' results in the years to find. Our experts await 'using the surge' with our customers from across the globe. It is time to accept artificial intelligence in a regulated method and guarantee we master allowing our customers to adapt to this technology with developments our team brings to the fore.
This paper provided the comparison of Augmented reality and virtual reality

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Cyberbullying and Added Dangers of Internet Communication Focused on College Students

Abstract

As part of an investigation into the risky behavior of Czech college students on the Internet, the topic of the paper is cyberbullying as it occurs among students. This article discusses the descriptive research results on a sample of 386 students from Olomouc's Palacky University's Pedagogical Faculty.

The study was descriptive and focused on PdF UP students in Olomouc's risky behavior, which is connected to information and communication technologies (especially the Internet).The number of victims and perpetrators of cyberbullying was the objective. The research simultaneously monitored the victim's willingness to seek assistance from a teacher, parent, sibling, or friend. The study also looked at how attackers and victims switched roles and how cyberbullying was linked to so-called sexting, in which adults and children shared sexually explicit content. One of the monitored research issues was the communication platforms used most frequently for cyberbullying (specific forms of cyberbullying).In this paper, we only consider the victim's perspective on the various manifestations of cyberbullying; The actual cases are also added to the results.

Introduction

Palacky University in Olomouc's study of risky behavior among students focuses on Internet-related phenomena that are associated with risky behavior among Czech adolescents .It follows the studies Risks of Internet Communication 1 and 2 (2010, 2011) and Risk of Internet Communication 3 (2012), as well as the study Cyberbullying and its psycho-social effects on university students (Mahaj, J. et al., 2011) and other studies.

Within the framework of the project OP VK E-Synergie - scientific network for risks of electronic communications (CZ.1.07/2.4.00/17.0062), the research was carried out and backed by the Palacky University Center for the Prevention of Dangerous Virtual Communication (www.prvok.upol.cz).

The study's primary focus is on keeping an eye on the following fundamental dangerous communication phenomena that are connected to the use of the Internet and mobile phones:

a) cyberbullying (various forms of cyberbullying linked to the Internet services - verbal aggression, blackmail, threats and attacks on the account),

b) the establishment of virtual contacts (communication with unverified Internet users, personal meetings, so called cyber grooming or social engineering),

c) sexting (sharing of intimate public materials on the Internet, providing these materials to a person without verified identity, continuity of sexting on other dangerous communication phenomena),

d) sharing of personal data on the Internet (with a focus on sharing facial photos),

e) use of social networks (with relation to the incidence of particular dangerous communication phenomena)

f) other related phenomena.

In the following text we will focus only on the first part of the research - the various forms and manifestations of cyberbullying from the perspective of the victims. But first we define the basic terms used later in our text. The definition of cyberbullying used in our research is based on existing definitions of bullying, where bullying is perceived as aggressive, intentional, repeated action or behavior carried out towards any individual or group that cannot defend (Whitney & Smith, 1993; Olweus, 1999). Other authors understand the bullying as a form of bothering that is based on the imbalance of power and the systematic abuse of power (Smith & Sharp, 1995; further Rigby, 2002). In the Czech environment the bullying is defined especially by M. Kolář and others.

In this context cyberbullying is defined as a form of aggression that is carried out against individuals or groups using information and communication technologies. This action is performed repeatedly (Belsey, B., & Smith further Elephants, 2007). Similarly, the cyberbullying is perceived by Hinduja and Patchin, who define it as intentional, often repeated, and hostile behavior intended to harm the victim using information and communication technologies, most often via mobile phone and the Internet. The definition is then develop and refined, for example, by Kowalski, Limber and others (2007-2008), who perceive cyberbullying as bullying carried out via e-mail, ICQ, mobile phones (SMS, MMS, phone calls), chat, website, and other ICT. Dehue (2008) sees cyberbullying as torture, threats, humiliation, embarrassing and other attacks carried out by using the Internet, interactive and digital technologies or mobile phones. The definition of cyberbullying are elaborated in the Czech environment (Kolář, M., Šmahel, D., Krejčí, V., Kopecký, K., Šmahaj, J., Vašutová, M. and others), with no significant deviations from foreign approaches.

In our research cyberbullying is monitored due to its various expressions across selected communication platforms (social networks, IM, chat, etc.), which focuses on both victims and aggressors.

Methods

Description of the research procedure involves research goals that will be followed by research problems (questions), next a description of the research sample including research methodology, timetable and method of data processing. Within our research we used the methodology validated in the research Risks of Internet communications 3 and 4 (Kopecký et al., 2011-2012). In the description of the methodology our focus is limited to the areas related to cyberbullying.

Research goals

The study was descriptive and focused on information and communication technology-related risky behavior among PdF UP students in Olomouc. It also sought to determine the number of cyberbullying victims and attackers. The victim's willingness to seek assistance from a teacher, parent, sibling, or friend was tracked simultaneously by the study. The research also looked at how victims and attackers switched roles and how cyberbullying was linked to sexting, which led to children and adults sharing sexually explicit content. Communication platforms used most frequently for cyberbullying (specific forms of cyberbullying) were one of the monitored research issues.

The research sample

The basic sample consisted of students from Palacky University's Pedagogical Faculty in Olomouc. They were invited to participate in the research by Palacky University in Olomouc and the project websites E-Synergie (www.esynergie.cz) and E-Bezpe (www.e-bezpeci.cz) via communication channels.These online resources are frequently utilized by students in the Pedagogical Faculty.
The survey was completed by 386 students from Olomouc's Palacky University's Pedagogical Faculty. There were 16,75% men and 83,25% women in the sample. According to the study programs, the sample was distributed similarly to the number of students enrolled in 2011 and 2012 (see Annual report on PdF UP's activities for 2011 and 2012). The majority of respondents (86,7 percent of the total sample) were between the ages of 20 and 25.

Research methodology

The use of a questionnaire as a starting point was chosen because the research was primarily quantitative.The research instrument consisted of 71 items—40 dichotomous, 2 polytomous, 22 with multiple possible answers, and 7 open questions—based on theoretical knowledge and arranged to reflect the goals and issues.The questionnaires were distributed to respondents electronically (online) through the E-Bezpe project's questionnaire system, university email directly through PdF UP's websites, and Facebook.

Anonymous questionnaire automatically verified, where it was sent from (IP address, regional affiliation, monitoring the behavior of respondents using Google Analytics, etc.).

The timetable of the research

Preparation of the research was launched on 1st November 2012, data were collected from 1st December to 31st January 2013. The evaluation was carried out during February and March 2013.

Processing of research data

The data were mostly on nominal and ordinal level of measurement, which corresponded to a subsequent processing, numerical operations and statistics. First we organized the data and then compiled them into tables of frequency. Descriptive problems were solved through the fundamentals of descriptive statistics (calculation of the characteristics of the area - central tendency measures, percent calculation) and even with the graphical representation. To test the hypothesis we used the test of independence chi-square for four square table. All testing was carried out at a significance level $\alpha = 0.01$.

Results

CYBERBULLYING AMONG UNIVERSITY STUDENTS.

In our research, we focused on the following areas:

A. Victims of cyberbullying We tracked the number of victims in relation to individual cyberbullying incidents and cyberbullying platforms. The next thing we saw was the victim taking on the aggressor.
B. Cyberbullying initiators We tracked the number of attackers and the platforms on which they operate in relation to individual acts of cyberbullying. We also followed, switching roles from victim to aggressor.
C. People who deal with cyberbullying The research focused on the people who cyberbullying victims would call in the event of an incident.
D. Manifestations of cyberbullying based on use of social networks (particularly Facebook) The study investigates the connection between the use of Facebook and cyberbullying.
E. Related phenomena The research revealed particular forms of virtual aggression, such as account theft, identity theft, and subsequent cyberbullying.

We focus on the many different kinds of cyberbullying in this text.Cases sent by students of Palacky University's Pedagogical Faculty to the online counseling center of the Center for the Prevention of Risky Virtual Communication (PdF UP) in Olomouc complete the descriptive data.We do not reveal the actual names of the people involved in the cases in order to safeguard our clients' privacy; however, the case description is accurate.

A. CYBERBULLYING OF STUDENTS - VICTIMS

The investigate checked following forms of occurrences within the cyberbullying:

A. Verbal attacks in cyberspace - harm through humiliation, insulingt, ridiculing, embarrassing students (verbal aggression).
B. Threats and intimidation of student.
C. Blackmailing students.
D. Identity theft, followed by cyberbullying.
E. Bothering by drop-calls.

F. Humiliation, embarrassing realized by spreading photographs.
G. Humiliation, embarrassing realized by spreading video.
H. Humiliation, embarrassing realized by spreading audio.

Cyber-bullying - harassment by drop-calls

Although cyberbullying realized by bothering or drop-calls is considered as one of the mildest and least dangerous forms of cyberbullying (in some studies it is not included among the manifestation of cyberbullying), we decided to include it among the forms of cyberbullying considering its extent in the student population. Cyberbullying realized by drop-calls experienced 38,73% of students as a victim (namely 134 out of 346 students) at Palacky University in Olomouc.

Sample situation

Denisa is enrolled in the bachelor's program for the second year of teaching. She began receiving drop-calls that involved cyberbullying two months after the start of the summer semester. Denisa received a series of dropped calls on her phone from an unknown individual with an unknown phone number. She was in a dorm and received the drop-calls 20 to 25 times per day, usually in the evening. She answered the phone several times, but all she heard was the sound of people breathing (huffing), and no one responded to her questions. Denisa then tried to getin touch with the caller via SMS, but she didn't hear back. More than five weeks passed before this took place. Denisa tried to contact the operator as well as the owner of the phone number by conducting a search on the Internet .After contacting the E-Bezpe project's online counseling center, she blocked the unknown phone number and added it to a blacklist. However, for the next three weeks, the drop calls from another phone number continued, and the situation reoccurred. Denisa blocked the phone number once more, and the drop calls stopped 14 days later.

Cyberbullying - verbal aggression

The most prevalent form of cyberbullying is various forms of verbal agression that are used repeatedly and with increasing intensity against students. This kind of cyberbullying typically takes place via SMS or social media, though email or other communication services are less frequently used for this kind of cyberbullying.36,97% of respondents (139 out of 376) reported experiencing cyberbullying in the form of persistent, long-term verbal abuse.

Cyberbullying - threatening and intimidation

Threatening is another relatively common form of cyberbullying. Threatening adds a new element of intense fear, elevating cyberbullying to new heights. While verbal forms of cyberbullying primarily target the victim's extreme humiliation without provoking fear (particularly fear for life, friends, pets, etc.),The primary goal of threats and intimidation is to incite fear.14,45 percent of respondents (51 out of 353) reported experiencing threats or intimidation.

Cyberbullying - humiliation and embarrassing by spreading photos

Cyberbullying realized using photographs of the victim is fairly widespread form of cyberbullying, which is with its intensity and focus on the higher level of intensity and danger than previous forms monitored. It is caused mainly due to the existence of a specific sensitive material of a victim (photos), which can be spread among a large numberof the Internet users (including those who do not know the victim). This kind of cyberbullying is often perceived as a form of teasing, as a positive way of communication with the aim to entertain and also toughen the victim, the boundary between teasing and cyberbullying is very shallow and badly done joke often grows in intense cyberbullying with a wide audience on the edge of viral spreading of discriminatory materials.

Photos of students who are drowsy and vomiting, photos with sexual content, such as pictures of naked victims, photos that compromise the relationship between students and teachers, photos that focus on homosexual relationships, photos that target ethnic minorities, and so on, are all frequent examples of compromising materials.

Identity theft and cyberbullying

Identity theft is a specific form of cyberbullying, in which the attacker first break into victim's account (eg. e-mail account, an account in a social network account in MMORPG game, etc.) and then under his/her name carries out

attacks on other Internet users. Attacks on account confirmed 32,24% of respondents (116 of 349), 18,64% of them also confirmed that the account was used for cyberbullying others. Identity theft used to have experienced cyberbullying 6,30% of respondents.

Cyberbullying - blackmail
According to approximately 5,71 percent of respondents, blackmail is a very severe and dangerous form of cyberbullying.

Cyberbullying - humiliation by spreading a video
2,49% of respondents reported experiencing cyberbullying that was made public through the distribution of videos. It was disseminated via common means of communication, including the mobile phone and the Internet.

Cyberbullying - humiliation by spreading audios

Toward the finish of our nonexistent positioning of the most widely recognized types of cyberbullying is embarrassment by spreading sounds that was capable by 1,97% of the respondents as the person in question. In this instance, it is a recording that reveals the victim's identity and shows the victim in absurd circumstances. The recording can then be used for blackmail and humiliation.

B. CYBERBULLYING - COMPARISON BETWEEN THE VICTIMS AND THE ATTACKERS

The percentage of victims who have also become the attackers by engaging in the same type of cyberbullying as the victims is depicted in the graph that follows .For instance, 55,56 percent of those who were the victims of cyberbullying discovered the practice by watching humiliating videos and acting as the attacker. The number of signs of cyberbullying that have been observed by both the attackers and the victims is used to calculate nominal data for various types of attacks.

Conclusions

A sample of Palacky University students' risky online behavior was the subject of a descriptive study that was conducted in 2012-2012, and its partial findings were presented in this paper. The findings indicate that university students are also subjected to a variety of forms of cyberbullying, with verbal abuse and drop-calls being the most frequently reported forms of cyberbullying by the victims. Cyberbullying can be found not only in children (see Risks of Internet Communications 3, 4, and 5), but also in adults (see Risks of Internet Communications, 3 and 4).

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Digital technologies, healthcare and Covid-19: Insights from developing and emerging nations

Abstract
COVID-19 pandemic created a global health crisis affecting every nation. The essential smart medical devices/accessories, quarantine facilities, surveillance systems, and related digital technologies are in huge demand. Healthcare, manufacturing industries, and educational institutions need technologies that allow working from a safe location. Digital technologies and Industry 4.0 tools have the potential to fulfil these customized requirements during and post COVID-19 crisis. The purpose of this research is to provide understanding to healthcare professionals, government policymakers, researchers, industry professionals, academics, and students/learners of the paradigm of different Digital technologies, Industry 4.0 tools, and their applications during the COVID-19 pandemic. Digital technologies, Industry 4.0 tools and their current and potential applications have been reviewed. The use of different Digital technologies and Industry 4.0 tools is identified. Digital tech- nologies and Industry 4.0 tools (3D Printing, Artificial Intelligence, Cloud Computing, Autonomous Robot, Biosensor, Telemedicine service, Internet of Things (IoT), Virtual reality, and holography) offer opportunities for effective delivery of healthcare service(s), online education, and Work from Home (WFH) environment. The article emphasises the usefulness, most recent development, and implementation of Digital technologies, Industry 4.0 techniques, and tools in fighting the COVID-19 pandemic worldwide.

COVID-19 widespread made a worldwide wellbeing emergency influencing each country. The fundamental shrewd restorative devices/accessories, isolate offices, reconnaissance frameworks, and related computerized advances are in tremendous request. Healthcare, fabricating businesses, and instructive educate require advances that permit working from a secure area. Advanced innovations and Industry 4.0 devices have the potential to satisfy these customized necessities amid and post COVID-19 emergency. The reason of this inquire about is to supply understanding to healthcare experts, government policymakers, analysts, industry experts, scholastics, and students/learners of the worldview of distinctive Advanced innovations, Industry 4.0 instruments, and their applications amid the COVID-19 widespread. Computerized innovations, Industry 4.0 devices and their current and potential applications have been looked into. The utilize of distinctive Advanced advances and Industry 4.0 instruments is distinguished. Advanced technologies and tools in fighting the COVID-19 pandemic worldwide.

Keywords COVID-19 · Industry 4.0 · Digital technologies · Healthcare · Telemedicine

Introduction

The Corona Virus Disease 2019 (COVID-19) named by World Health Organisation (WHO) emerged in Asia late 2019. As of 16 November 2021, 255 million people were infected and over five million people died globally [1]. The virus spread to 220 countries in Asia, Europe, North and South America, Africa, Australia, and Oceania. The ratios of infection to population and death to the population for the top 50 affected countries and a low affected

country (China) are shown in Fig. 1. No countries rich or poor could escape the mayhem of COVID-19. The top 8 countries' ratio of infected people to the total population (of a country) are 14.3% in Israel, 14.1% in the UK, 14% in Serbia, 13.5% in the Netherlands, and 12.8% in Belgium. China had the lowest rate of infection among countries with more than 100 million people (0.007%), followed by Pakistan (0.6%), Japan (1.4%), Bangladesh (0.9%), Indonesia (1.5%), and India. Peru had the highest infection-related death rate (9.1 percent), followed by Mexico (7.6 percent) and China (4.7%). The world average infection to popula- tion and death to infection were 3.2% and 2.0%, respectively (Fig. 1).

WHO pronounced Coronavirus a worldwide pandemic as it made a phenomenal emergency in wellbeing, economy, educa-tion, worldwide portability, culture, sports, and so forth.that our human civilization has never experienced [1].The Between public Council on Scientific classification of Infections (ICTV) called it a serious intense respiratory disorder Covid 2 (SARS-CoV-2) on 11 February 2020.Almost all physical communications were disrupted as a result of nationwide shutdowns that were imposed on all continents to stop the spread and force people to perform tasks from safe locations or their homes.An unprecedented rise in demand was experienced for digital access, technologies, equipment, life-saving devices, and tools.Due to COVID-19 emergencies, access issues to medical facilities and healthcare services have a significant impact on both healthcare service recipients and providers.Besides, advanced splits between created and agricultural countries, metropolitan and country populaces, monetary and social divergence make medical care benefits really testing and out of reach.

Available information and data on the COVID-19 pandemic affecting healthcare systems in emerging and developing countries allow evaluating digital technologies and Industry 4.0 tools that are progressively being used and can have a notable impact on healthcare delivery during the COVID-19 pan- demic. Therefore, this study aims to provide understand- ing to healthcare professionals, government policymakers, researchers, industry professionals, academics, and students/ learners of the paradigm of different Digital Technologies, Industry 4.0 tools and their applications during the COVID- 19 pandemic. The study is based on data and information collected from open and subscribed literature/ databases, individual/ personal contacts, government sources, press reports, news, media portal, and case studies.

For this study, data published by governments and major indexing and search engine tools like Google Scholar, Scopus, IEEE Xplore, Research Gate, PubMed, Academic Info, Microsoft Academic Search, Journal Seek, MEDLINE, Science Direct, Web of Science, SpringerLink, Wiley Online Library, Emerald, LinkedIn Learning (previously Lynda.com), Factiva, ProQuest Central, and IBISWorld were used. During the COVID-19 pandemic, the study covers all advanced digital technology inventions and innovations, as well as the development of Industry 4.0 and its applications in healthcare service delivery. The paradigm of Industry 4.0 and their implementation strategies during the pandemic will be better understood by healthcare professionals, academics, researchers, policymakers, industry professionals, students, and community members, according to the findings. In the not-too-distant future, developments in digital technologies could represent a paradigm shift for various sectors. There will be applications for the technologies developed during the COVID-19 pandemic in numerous other fields.

Digital technologies and industry 4.0

Industry 4.0 or the fourth mechanical transformation is the associate- association of computerized innovations with altered progressed fabricating and generation frameworks regularly called "Smart Fabricating or Shrewd Factory". The Shrewd Manufactur- ing innovation of Industry 4.0 has plenteous potential for demand-driven supply chain

administrations amid the COVID-19 emergency [2]. Figure 2 appears four fundamental stages of the mechanical transformation.
The major clinical and medical issues can be solved by digital technologies like artificial intelligence, cloud computing, big data analytics, the Internet of Things (IoT), deep learning, and blockchain technology [4, 5].In order to combat the coronavirus, the Industry 4.0 generation can use advanced information technology applications and modified advanced manufacturing to link the industrial revolution and the medical field.Various digital technologies and 3D printing devices can reduce the demand for essential medical accessories.Javaid et al.
provided a brief description of the technologies of Industry 4.0 and how they can be used to fight COVID-19.Shashank and other highlighted Industry 4.0's operational aspects during the COVID-19 pandemic.Khan and others8] looked at a variety of smart technologies that helped stop the COVID-19 pandemic from spreading, such as the use of drones, robots, artificial intelligence, and sensor technology.
The relationship between sustainable supply chain performance during COVID-19 and technological innovations between the real and virtual worlds was investigated [9].Several researchers [10–12] conducted reviews of digital technologies that emerged during the COVID-19 pandemic in various fields.Since March 2020, industries, educational institutions, and healthcare services have been hardest hit by lockdowns.For instance, aside from Coronavirus patients, non-Coronavirus weak populaces are denied of essential medical services administrations as many specialists including General Experts (GPs), attendants, facilities, clinical focuses, and medical clinics, are hesitant to give medical care administrations, dreading Covid openness.When possible, healthcare professionals prefer to offer their services remotely.1.5 billion students in 188 nations and economies will be locked out of school in 2020 [13].In South Asia alone, over 400 million school children were locked out of schools for 19 months. Cam- puses are closed for university students in most countries including Australia, New Zealand, Bangladesh, India, Paki- stan since March 2020. With the COVID-19 pandemic still raging, many education systems are struggling, and the situ- ation is constantly evolving from school closures and remote learning. Commercial and industrial sectors have severely been affected by the pandemic. Continuous ‘off and on’ lock- downs and the requirement for social and safe distancing at the workplace and industry are affecting not only productiv- ity but also education and healthcare delivery. The use of digital technologies/Industry 4.0 techniques can significantly minimise the impact of the COVID-19 pandemic [14]. For example, to prevent the spread of COVID-19, people were isolated to work and study from home. IoT solutions/virtual reality such as Microsoft Teams/ Zoom meetings/ Google Meet/ Tencent (VooV), platforms for virtual education (like Blackboard, Moodle, Canvas, and others)are increasingly being used to carry on commercial services and operations, industrial activities, the provision of healthcare services, and educational endeavors. Figure 3 depicts a few digital technologies and tools that have enormous potential and/or are already being used to mitigate the effects of COVID-19.

3-D printing technology for medical devices

Three-dimensional (3D) printing is a computer-controlled process that creates three-dimensional objects by depos- iting materials, usually in layers using computer-aided design. It makes it possible to produce intricate shapes, like precise geometric shapes, which are typically more difficult to produce using the standard manufacturing method.Additive Manufacturing (AM) and Rapid Prototyping are the most common names for this process [15].In order to produce a product, 3D printing does not necessitate the use of a large and complicated industrial setup. Instead, it can be operated and controlled remotely using cloud technology with only a small staff [16]. This com- puter-aided design (CAD) manufacturing technology is used to manufacture customized medical implants, tools, and devices. During

COVID-19, it came as an emerging technology in the medical field for manufacturing medical devices including face masks (e.g., surgical and N95/ KN95/P2 Respirator), ventilator respiratory valve, face shield, Individual Defensive Gear , hand sani- tiser holders, entryway handle connections, 3D printed quar- antine booths, SARS-CoV-2 test swabs, Oxygen valves, etc. [16–18], which are appeared in Fig. 4. Extra 3-D printed items created amid this widespread incorporate 3D printed confront shield by Siemens Middle of Greatness of NIT, Tiruchirappalli [20], re-usable confront cover by Vir- tual Wilderness Mechanical autonomy Private Restricted, Coimbatore-based start-up in India, protective cap frameworks as PPE [21], KUKA test robot [22], etc.

Artificial intelligence

Using only their sense organs, humans are naturally gifted with the ability to quickly distinguish between objects. However, machines perform calculations and numbers better. Even though machines don't get tired and get faster, more accurate, and more precise than humans, they can't identify objects. The method or technology that imitates human intelligence in machines is known as artificial intelligence (AI).On the other hand, a machine that does not have the AI is unable to recognize objects because it lacks technological capabilities (such as sensors, imagery, movement, etc.).In a nutshell, artificial intelligence (AI) enables a machine to mimic human behaviour, while a subset of AI enables a machine to automatically learn from previous data without explicitly programming.AI aims to create intelligent computer systems that can solve difficult problems like humans.

Big data and mask R CNN are used to store infected patients in a cloud repository.

Big Data is an analytic field that extracts desired and detailed information from large and complex data sets [32– Python with its NumPy libraries is one of the promi- nent computer languages used in the domain of Big Data. Regional Convolutional Neural Networks (R-CNN) has the capability of recognizing objects by marking out rectangular boundaries around them [35]. Mask Regional Convolutional Neural Networks (Mask R-CNN) is a more advanced form of R-CNN which has the capabilities to mark out exact bounda- ries of recognized objects with almost a single-pixel image precision [36].

A detailed worldwide repository of positive COVID- 19 patients with their symptoms, medical history, reports, X-Rays, and CT (Computer Tomography) scans can be made and stored on the cloud so that they can be accessed by registered and authorised medical institutions /practition- ers worldwide. This data set can be used to effectively train R-CNN with very high accuracies (above 99%). A trained model can now predict if a patient is suffering from COVID- 19 and for how long. This can speed up the testing procedure for COVID-19 where a patient can know whether he/she is COVID-19 positive simply by providing his/her medi- cal history, symptoms, and X-Ray and/or CT scan reports. Ouyang et al. [37] developed a 3D CNN network to assist the diagnosis of COVID-19 patients. Wang et al. [38] used a CNN based Deep Learning (DL) for screening COVID- 19 infected patients with an accuracy of 89.5%, a sensitiv- ity of 87%, and specificity of 88% by using their computed

Autonomous robot

COVID-19 pandemic has created the need for prevent- ing interhuman contagion and stopping the spread SARS- CoV-2 virus. Using an autonomous robot during the COVID-19 pandemic, it is possible to reduce interhuman contagion, manage, monitor, and control human loitering or purposeless movement during lockdown [39, 40]. A robot can be deployed for disinfection and sanitizing large areas of the containment zone with minimal downtime. It can also help the delivery of food items and medicine to COVID-19 positive patients in hospitals without direct human contact [41–43]. Humanoid robots, autonomous vehicles, quadcopters

(commonly known as Drone) and other intelligent robots are excellent examples of Autonomous robots. Examples of some robots used for COVID-19 are shown in Fig. 9.
Drones played a major role during lockdown for patrol- ling and analysing containment zones thereby helping the law enforcement and protective agencies. As drones are prepared with progressive cameras, various sensors, and inte- grated data management systems, they can check an individ- ual's temperature, heart and breathing rate from a distance and hence, it helped in the rapid testing of COVID-19 cases. Tavakoli et al. [44] examined some other robots including telerobots, collaborative robots, social robots and wearables that can also be used during the COVID-19 situation. Robot.

Conclusions

The affect of COVID-19 on healthcare administrations conveyance is multitudinous. Computerized Advances and Industry 4.0 apparatuses/ methods have appeared colossal capabilities that can be utilized to alter the situation of the show world amid and post COVID-19 widespread. COVID-19 played a imperative part within the change and advancement of restorative and healthcare offices, and benefit conveyance.
Digital health and telemedicine play a crucial role in providing healthcare to vulnerable and immunocompromised people around the world. This prevents them from contracting the COVID-19 virus and keeps frontline healthcare workers from contracting the virus by reducing the spread of the virus between people.This permits redirecting assets and offices for Coronavirus patients' treatment and care.
PPE, face shields, masks, nasal swabs, and other products can all be made using 3D printing's rapid prototype manufacturing capabilities. COVID-19 protective gear can be made quickly and precisely thanks to 3D printing.
COVID-19 patients can now receive non-contact services thanks to an autonomous robot.The use of an autonomous robot reduces the amount of direct contact with COVID-19 patients and makes it possible to perform disinfection work; thereby limiting the spread of viruses and COVID infections.

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Digital Technology and its Influence on Globalization

Abstract

The economic growth foundation has consistently transformed and altered key variables throughout history. After World War II, progress was fueled by industrial expansion, modernization, and economic prosperity (Fatima, 2017).Through institutional reform and technological advancement, the growth was characterized by an increase in workforce productivity up until the 1970s.The change in underdeveloped nations and the shock to the price of oil led to catchups with the industrialized world. From the late 1970s through the 2000s, governments placed their faith in substantial moderation due to lower inflation and unpredictable development. People were forced to reevaluate growth programs and become more goal-oriented as a result of the digital technology boom and the fourth industrial transformation at the turn of the century. In the modern economy, digital technology emerged as the driving force behind the fourth industrial revolution and directing economic growth.

Introduction

This study looks at how globalization has affected how quickly people around the world are using new technology.In order to demonstrate the significance of globalization as an overspill component, this paper investigates the primary factors of digital technology transfer.Using the digital adoption index, KOF globalization index, and global competitiveness index, this article will extract the globalization effect from nation-level statistics for a group of African, European, and North American nations.The cycle of globalization encourages creative thinking and accelerates the spread of new technologies.A randomized panel model is used in this article because there are so many statistics about how much digital technology is used.Fatima (2017) used organizational-level data from over 25 industrialized and developing nations to investigate the connection between technological acquisition and transparency.The aforementioned researcher discovered that, particularly in procedural innovations, foreign direct investment (FDI) is much less likely to develop than local businesses.Knowledge can now be shared in a unique way thanks to globalization;However, this does not necessarily benefit all nations and institutions.

Min and her colleagues (2018) demonstrated that there is a wide range of options and a lot of complexity involved in deciding whether to accept or reject particular technological advances or solutions.Marak and others2019) investigated the idea of acquisition and diffusion and discovered a number of factors that influence a person's decision to adopt technologies.Methods for implementing new technologies are constantly evolving as a result of the complexity of current digital technology.Marak et al. (According to (2019), technology integration is a complex developmental and societal phenomenon that varies depending on the perspective of the individual.Globalization boosts technological adoption and enhances global competitiveness by transferring information across borders.Globally, there is a lack of scientific data, making it difficult to determine how globalization affects technological adoption.

The purpose of this study is to ascertain the significance of globalization for the dissemination and application of digital technology.This study provided information about nations and groups of nations as well as information about the world using data from Europe, North America, and Africa.Using a randomized panel data framework, this study aims to demonstrate the impact of international adoption rates of modern technologies on globalization.Each nation's rate of technological adoption is influenced by the financial, sociological, and geopolitical aspects of globalization.The use of the randomized model in this investigation is justified by the preceding.The purpose of this study is to determine the causal links between globalization and digitalization in practice.Globalization remains a necessary but insufficient condition for the adoption of digital technology, according to this study's findings.Globalization accelerates the adoption of the most recent technologies.In speeding up a country's financial reception of computerized advancements, specialists ought to expand the globalization file, creating information and monetary stream.

Literature Review

The mechanisms and factors that influence the adoption of new technology appear to be the subject of a lot of research.A controllable method was developed by Lopez-Martin and Perez-Reyna (2021) to investigate how the steady-state technological option is affected by technical interrelatedness and insufficient contract terms.The authors found that contract insufficiency has a greater impact on digital technology adoption in certain industries that have a greater number of complementary intermediary supplies.Adani (2017) assessed endeavors' thought processes in executing cost-cutting developments across different products market rivals in an essentially unmistakable area.The authors argued that the efficiency and cost of modern technology are dependent on the final rating result and are never inherent.

The gap between the adoption of individuals and businesses has previously been demonstrated (Huda, 2019).They think that the first person, business, or outsider to use new technology is what constitutes technology acceptance.In such a setting, technology may refer to novel new products, procedures, or administration.The authors highlighted the significance of costs, benefits, communications infrastructure, and the difficult aspects of integrating emerging innovations using examples from technology acquisition..

Sadik-Zada and others2022) demonstrated a correlation between high disposable incomes and robust organizations with lower adaptation costs.According to the theory, the total costs of technology adoption, as well as transportation and administrative costs, have an impact on whether or not a location is modernized.

The nation's openness to foreign investors, the admission of businesses, advanced technologies, and information exchange are all affected by the connections between digital technology adoption decisions and globalization.Min et al. (2018) looked into the technology acceptance and diffusion hypothesis and found a number of factors that influence whether or not a person adopts a digital innovation.Marak et al. (2019) discovered that the decision to accept or reject certain technical enhancements and remedies is sporadic and unpredictable.According to Fatima (2017), another study looked at corporate data from over 25 developed and developing nations to see if there was a link between accessibility and adoption of digital technology.FDI is significantly less innovative than local investments, especially in terms of innovation.Although not all nations and businesses will necessarily benefit from globalization, globalization offers a one-of-a-kind opportunity to share knowledge (Fatima, 2017).Piana and others2018) came to the conclusion that, in this setting, family-owned businesses rely on a variety of organizational adaptation components to steer them beyond longevity.Such predominance is in many cases not reflected in industrialized economies, where reliability is higher, associations are more grounded, and seriousness appears to be fiercer.

Technology adoption readiness varies between family-owned and non-family businesses.Kim and othersBy demonstrating that the tendency to use technologies has an effect on people's behavior following their adoption, 2020) provide a theoretical advance.The research shows that every aspect of technological preparedness has a very different effect on how customers act.A person fundamentally influences innovation acknowledgment, however peer molding likewise is by all accounts a significant job.Olschewski and others(2018) examined the connection

between interpersonal impact and technological preparedness when adopting collaborative systems. In contrast to conventional adoption studies, which focus on early technology acceptance, the authors investigated the influence of such issues on making digital and their adaptation. They discovered that relational influence trumps technical readiness and conventional adoption indicators from the viewpoint of human acceptance of collaborative tools. Takahashi and co.2019) looked into the factors that affect the distribution of resources and technology adoption. Financial and non-financial benefits of adoption, interpersonal learning, training, scale economies, technology inefficiencies, debt restrictions, risks and inadequate insurance, and deviations from behavioral standards predicted by basic reasoning frameworks were all mentioned.Learning played a significant role in the authors' view of the development cycle as a whole, with the adoption of emerging technologies and their effective application being crucial components.

The authors discovered that lowering the entry fee from the median value of the world's bottom 29.5 percent to the threshold of the United States led to a 13% increase in manufacturing output and a 28% increase in non-agricultural productivity levels overall.The acceptance of new technologies is hampered by commercial advocacy and preservation, which in turn hinders worker output and socioeconomic advancement.Huda (2019) has dissected the effect of the strategic reception of enterprises' innovation through native firms on moving computerized innovation impacts.The author adds that local businesses are prohibited from adopting ubiquitous technologies in order to avoid competing with large corporations in the regional market. This is in accordance with native product standards.The technological adaptation process in family-owned businesses necessitates a clearly defined digital innovation paradigm in order to accelerate successful technological adoption in small and medium-sized businesses (Piana et al.,2018).Perspectives on innovation, corporate identity, market ingenuity, and the characteristics of the primary users are necessary for the delayed adoption of technology (Olschewski et al.,2018).Small and medium-sized businesses' key engines of digitalization are marketing, promotion, organizational innovation, and product development (Eze et al.,2021).

This report concludes that comparable technology adoption studies and the existing literature on globalization and digital technology implementation diverge significantly.For instance, Fatima (2017) made the observation that globalization might hinder the creative endeavors of businesses in the region.To remain competitive in the market, regional businesses are compelled to innovate their products and processes.Digital technology and globalization are the primary drivers of unrestricted innovation (Huda, 2019).Globalization has a tendency to focus innovation more on products than processes.Innovation and knowledge flow continue to have a greater impact on countries with medium and upper-middle incomes than on countries with low incomes.The adoption of digital technologies does not fully benefit emerging economies.Furthermore, Takahashi et al.2019) looked at the obstacles that underdeveloped economies face when implementing informational advances.The author discovered that computer technology transmission and use are hampered by inadequate government regulations, infrastructures, and education and training..

Methodology Specifics

The impact that digital technology has had on globalization is examined in this report using data from North America, Europe, Africa, and other regions.The DAI, KOF, and GCI indexes, which the researcher found in online government databases (Gygli et al.,), serve as the study's parameters.2019;2019, World Bank;2022 (World Bank).First, the digital adoption indicator, which measures a nation's digital engagement across multiple domains, is referred to as the DAI.The Economic System = Businesses + Population + Authorities for more than 180 nations makes up the indicator (The World Bank, 2022).According to Gygli et al., KOF is a globalization indicator that measures the financial and sociopolitical aspects of globalization.2019).For more than 200 nations, the KOF globalization indicator includes over 40 contributing causes that cover economic, monetary, social, cultural, and governmental aspects of globalization.Thirdly, the global competitiveness indicator, which measures a nation's distance from the competitiveness border, is referred to as the GCI (World Bank, 2019).Establishments,

infrastructures, technology penetration, economic sustainability, healthcare, education, market structure, labor force, the banking industries, market shares, corporate vitality, and innovation capabilities for over 140 nations are all included in the index, which ranks them from 0 to 100.
The researcher employed a panel data modeling strategy to examine the statistics.The researcher could investigate the international connection between globalization and technology adoption by employing a panel data analysis perspective.By not focusing on particular countries or case studies, the aforementioned method avoids the potential bias of a time-series data approach.The selection of nations based solely on the presence of digital penetration statistics is limited due to the fact that panel data analysis necessitates a significant amount of data.

KOF Index

They discovered that interpersonal impact trumps technical preparedness and conventional adoption indicators from the perspective of human adoption of collaborative tools. Takahashi and colleagues looked into the factors that affect how resources are distributed and how technology is used. According to the data they gathered, countries in Africa, including some in South America, have the lowest KOF indices. Europe and North America, on the other hand, have the highest KOF indices. Kenya, Tanzania, Libya, Nigeria, and South Africa are just a few examples of African nations with KOF indices of 55.4, 49.90, 55.06, 55.29, and 70.20, respectively (Gygli et al.,2019).However, countries in Europe and North America, such as France (with a KOF index of 87.63), Germany (with a KOF index of 88.73), the United Kingdom (with a KOF index of 89.31), the United States (with a KOF index of 82.28), and Canada (with a KOF index of 84.25)2019).The above figures show that most evolved nations have a higher KOF list which gives an indication of solid monetary, political, and social elements of globalization2019).

GCI Index

The data that were collected show that countries in Africa have the worst scores on the global competitiveness index, while countries in Europe and North America have scores that are higher than the global median.Kenya, for instance, is ranked 95th, Tanzania is 117th, Nigeria is 116th, and South Africa is 60th (The World Bank, 2019).The United States of America, on the other hand, comes in at number 2, followed by Canada at number 14, the United Kingdom at number 9, and France at number 15 (The World Bank, 2019).In terms of productivity levels, policies, institutions, and infrastructure, the most developed nations are highly competitive, as shown by the aforementioned figures.

Findings and Results

The use of cutting-edge technologies and the degree of globalization were found to be strongly linked in this study.This study predicts that the DAI index has an impact on globalization intensity, as measured by the KOF index, and international competitiveness, as measured by the GCI indicators. This prediction is made by employing a randomized variables panel data model on the KOF index.
As a result, this study demonstrates that adoption and international competition are linked to globalization and digitalization.
Globalization continues to have a significant impact on inventiveness and international competitiveness through the spread of digital technology.
Digital innovation is widely used in countries with a lot of globalization, which makes them more competitive, productive, and creative.The disparities in globalization between nations are paralleled by the disparities in new digital adoption across nations.The findings of this study provide solid empirical evidence that globalization is necessary for the transmission and acceptance of digital technologies.To learn more about how globalization and the use of digital technologies in the business sector communicate with one another, more research is needed.The degree of globalization is related to a lower barrier to digitalization acceptance because regional businesses press domestic institutions and policymakers to lower barriers to technology exchange.Lifecycle management

performance is improved as a result of globalization's reduction of technological obstacles, facilitation of digital technology adoption, adaptation to fierce international competition, and pressure on domestic businesses to adapt.Globalization is a necessary but not sufficient condition for the spread of digital technologies.Because technology determines socioeconomic success in many nations, more research on the dynamics of globalization and the adoption strategy of digital technologies at the state and company levels is required.

Conclusion and Future Recommendations

Although globalization is still a significant means by which the adoption of modern technology influences inventiveness, it is not the only option.Global competitiveness and multifactor performance are significantly impacted by digital technology as a result of globalization.For instance, researchers from Europe, Africa, and North America have utilized the randomized variables panel data method to produce objective support regarding globalization in relation to the utilization of digital technologies by nations.This study is one of the few that we know of that uses complex and multifunctional parameters for the GCI, KOF, and DAI indexes in a single paper.The differing and increasing adoption of digital technologies among nations reflects various levels of globalization.This study's scope is constrained because the modern technology diffusion rate indicator's statistics are only available for many months and 180 countries.By and by, the record is the best measurement for estimating the unpredictability of present day innovation reception in a country.The choice of restricted data structures is also limited, making it impossible to use panel data regression methods that are more involved. According to the findings of this study, globalization continues to play a significant role in the adoption and dissemination of digital technology.The majority of the developed research methods are demonstrated to be effective in this study.However, the data show that the study model's relationship between globalization and adoption of digital technology is not as strong as suggested.The above is because the DAI has only a limited amount of historical data.The conceptual model accounts for approximately 85% of the variations in digital technology adoption and its effects on globalization despite this constraint.In order to further develop this study paradigm, mathematical analysis will be required in the future.Digital technology appears to be a strategy for removing obstacles to active learning, increasing satisfaction, and encouraging innovation, according to the research.Practitioners and researchers consider digital technology to be a driver of competitiveness and a predictor of performance due to the inner dynamic underlying globalization and its development.Globalization is significantly impacted by digital adoption, which boosts productivity and creativity and, consequently, urbanization and competitiveness.

The goal of future research should be to expand the study's scope.By incorporating additional parameters into the formula, prospective researchers would be able to employ more complex panel data statistical methods and enhance the model's overall performance.The best match is obvious and has a good chance of being right.Concerning the remaining 15%, researchers must continue to enhance the mathematical framework with additional parameters and search for a particularly pronounced globalization-related effect.Although it is evident that it is significantly broader than the parameter estimates presented here, the one discovered in this study is relevant to the economy.The DAI index's limited information volume and the inability to utilize more advanced panel dataset models are the primary flaws in this study.Governments should eventually actively participate in globalization operations if they intend to boost economic development through an increase in multivariate regression output as a result of innovation.The preceding factors will boost digital technology adoption, development, and industrialization as well as technology and information exchange.

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LIBERTY OF TALKING AND EXPRESSION VS COMMON MEDIA VIOLATIONS

ABSTRACT

People are more likely to use social media platforms like Facebook, WhatsApp, Twitter, Instagram, and YouTube as a result of technological advancements.to read and discuss information and news. A mobile and web-based technology for creating a social network in the virtual world through a collection of online communication channels is referred to as social media. Because information shared by users in different parts of the country can be accessed by anyone, social media technology has reduced the size of the world. Every person has the right to express themselves freely by seeking, receiving, and disseminating information and ideas through any medium, regardless of borders. Every Indian citizen has the right to communicate and express themselves through social media in a democracy. We are able to upload, uplink, comment, like, share, and so forth because we enjoy this freedom. through online platforms. These social media platforms permit total or complete expression; But how are we using it as internet users? This paper examines social media-related violations of freedom of speech and expression.

Keywords: Freedom of speech and expression, Government, Policies, Restrictions, Violations, Social media

I. INTRODUCTION

There are a number of legitimate disagreements regarding social media and its impact on society.One of the most alarming aspects of the way social media has altered public discourse is the proliferation of horrific content, from child abuse to revenge pornography.As a consequence of this, it is possible that social media will shift from being platforms where a small number of powerful voices can reach a large number of people to being platforms where these disputes are used as a pretext to restrict freedom of expression (Singh, 2019).

In a lot of ways, India was a safe haven for people who wanted to be themselves without fear of being shot at.Even though Indians' personal circumstances are significantly better than those of their counterparts in other nations, the image has lost its ability to relax and captivate them.I'm primarily referring to the use of so-called "cyber laws," such as Section 66A of the 2000 Information Technology Act, to restrict freedom of speech and expression on social media platforms like Facebook for the purpose of this discussion (Jones, 2021).

II. SOCIAL MEDIA

On social media platforms, technologies for sharing and discussing content, such as mobile phones and the internet, dominate. The internet can be used to communicate in a variety of other ways, including: through, among other things, writing, images, videos, music, and so on. It is possible to transform correspondence into an intuitive conversation by using web-based entertainment, which incorporates electronic and mobile advancements (Singh, 2019).

It is referred to as "virtual entertainment" on the internet and portable platforms that enable individuals and organizations to share and trade client-created content. "Virtual entertainment" is defined as "a bunch of web put together applications that grow in accordance with the calculated and mechanical underpinnings of Web 2.0, and that permit the creation and sharing of client-created content" by Andreas Kaplan and Michael Haenlein. The Internet's "Web 2.0" stages are referred to as such because they take into account customer investment. "Client created content" refers to all of the ways in which users can communicate with one another and share data in the world of online entertainment. The Society for Financial Cooperation and Development states that content referred to as "client delivered" should adhere to three specific models:

1. To begin with, it should be made available to the general public via a publicly accessible website or on a private social networking site.
2. In terms of creativity, it necessitates the least amount of work.
3. It's "made outside of professional procedures and practises." '

Mobile virtual entertainment, also known as social media, can also be used with mobile phones.The client's current (area awareness) and the time delay between sending and receiving messages because it is operated on mobile phones, versatile web-based entertainment (time-responsiveness) contrast with conventional virtual entertainment (Singh, 2019).

III. LIBERTY OF TALKING AND EXPRESSION

Regardless of where they live, which is certain, everyone has the option to freely communicate their thoughts across all boundaries and mediums without fear of retaliation or abuse. This is frequently thought to be obvious. According to Barak-Erez & Scharia (2011), the Constitution guarantees speech and expression.

The right to free speech is a complicated one. Taking into account that Opportunity of articulation isn't free and goes with different responsibilities, the law could think about specific limitations on how it might be used.

"Freedom of expression" has been used primarily since the Greek Athenian period, which began more than 2400 years ago and continues to this day. According to Buyse (2014), the following is a list of some of the most widely accepted meanings of opportunity of articulation that are generally regarded as general guidelines:

- Individuals have a fundamental right to freedom of opinion and expression, which incorporates the ability to communicate one's thoughts through any medium and without regard to public lines.
- The option to uninhibitedly offer one's viewpoints unafraid of being aggrieved should be ensured to everybody." "The opportunity to look for, obtain, and spread data and thoughts of various sorts regardless of boundaries, whether verbally, recorded as a hard copy or on paper, in imaginative structure, or by some other method for his decision" is ensured to each person under the Universal Declaration of Human Rights.

The right to " Liberty Of Talking And Expression" is also guaranteed to all Indian citizens by Article 19 (1) (a) of the Constitution. The right to opportunity of articulation protects all forms of verbal or visual articulation, including speaking, writing, distributing, recording, and participation. Additionally, according to Raza (2016), the rules of free speech safeguard opposing viewpoints.

The term "freedom of speech and expression" refers to any act that seeks, obtains, or transmits information or ideas, regardless of the medium through which it is performed. The possibility of articulation, in the mind of John Milton, is a multifaceted right that includes not only the capacity to communicate or circle ideas and data, but also the option to look for, get, and send data, among other things.

IV. RESTRICTIONS AND LAWS ON FREEDOM OF SPEECH AND EXPRESSION

Residents are not granted permission to speak or distribute without consequences because of freedom of expression. It is not wide open, and it protects everyone from consequences regardless of how they choose to use words (Cohen-Almagor, 2017).Restrictions are imposed by Article 19(3) of the ICCPR for the following reasons:

• To safeguard public safety, public demand, general well-being, or ethical quality;

• To protect the freedoms and rights of others.

Under Article 19(2) of the Indian Constitution, the assembly is allowed to embrace regulation that limit the option to free discourse and articulation for the accompanying grounds: psychological oppression (Yasmeen & Alastair, 2021).

- India's independence and integrity
- The safety and security of the country
- Good connections with other countries
- Maintaining law and order in society
- Morality or decency
- Disobedience to a court order
- Incitement to commit a criminal offence

Despite the absence of a specific rule governing virtual entertainment, many components of India's alleged "digital regulations" can be used to find a solution for infringements of privileges in the internet, the web, and online entertainment. The following are the appropriate arrangements and resolutions (Behera, 2017):

a) The Act includes penalties for PC-related offenses that can also be committed through online entertainment. These offenses include modifying PC source code, committing PC-related offenses listed in Section 43, sending hostile messages through correspondence services, committing widespread fraud, cheating by personating PC assets, disregarding security, and digital illegal intimidation.

b) The Central or State Governments of India may issue a mandate for the capture, observation, or unscrambling of any data communicated through a PC asset in order to protect India's power or respectability, the security of its residents, the country's guard, agreeable relations with other nations, public demand, and the anticipation of any cognizable offense from being submitted under Section 69.

c) For the same reasons that Section 69A prohibits free access to any material, the public authority may restrict the general public's access to any happy through any PC asset under Section 69A.

d) In accordance with Section 69B of the United States Code, the central government has the authority to issue orders authorizing any office to screen and collect information on PC traffic when there is a legitimate concern for network safety.

e) According to Section 79 of the Criminal Code, mediators may be held accountable.A middle person is not responsible for any data, information, or correspondence interface connecting with an outsider that he makes accessible or facilitates under Section 66A of the Information Technology Act of 2000.

V. FREEDOM OF SPEECH AND SOCIAL MEDIA

People can openly articulate their thoughts and offer their perspectives with the other world on account of the Web and virtual entertainment. In the past year or two, there has been a growing movement worldwide in support of reform, justice, equality, the accountability of the powerful, and the respect for human rights (Jones, 2021). The Internet and social media have played a crucial role in many of these movements due to the ease with which people can connect and share information on the Internet and through social media. According to Kaplan & Haenlein (2010), the Human Rights Committee of the United Nations has also attempted to put the concept of freedom of expression into practice in the contemporary media environment, which is dominated by the internet

and mobile devices. However, it has encountered difficulties in doing so. The Committee recommended that governments make every effort to ensure that these new media remain independent while also ensuring that their citizens have access to them, given that the Internet has emerged as an international network for the exchange of ideas and perspectives that is independent of traditional mass media. Both Article 19(2) of the International Covenant on Civil and Political Rights, which covers the internet and social media platforms, and Article 19 of the Universal Declaration of Human Rights guarantee the right to freedom of speech. Regardless of the medium through which they are communicated, India's Constitution and other international agreements recognize freedom of expression, including the right to free speech, as a fundamental right. As a means of exercising one's fundamental human right, access to social media and the internet has also been recognized as such (Tandon, 2011).

Until recently, governments around the world relied on a variety of justifications to conceal their actions from the general public. Governments are making attempts to control social media, which they see as a threat due to its enormous capacity for public information dissemination. The Internet has established itself as the foundation of modern civilization with its infinite potential and extensive reach. Because of how valuable it is for storing and disseminating information and ideas, it has been an integral part of the functioning of democratic democracies all over the world throughout history. With the help of the internet and social media sites like Facebook and Twitter, people from all over the world can now connect. However, the protest's strength has not diminished despite the fact that not everyone is present. According to Tiwari & Ghosh (2018), this is why governments all over the world are attempting to restrict the use and accessibility of the internet.

The Internet serves a useful purpose, but it can also be misused, supporting the government's control of online information in the public interest, as stated in the Constitution. Social media makes it easy to commit a variety of cybercrimes, such as defamation, invasion of privacy, incitement to commit crimes, and racist remarks. Once such noxious material is released, it quickly spreads and is extremely difficult to contain or stop. Therefore, the government's control over social media is crucial in this setting.

As long as it serves the interests of the people, government authority can satisfy individual and collective needs. In this instance, the government starts censoring, which means it starts limiting people's civil rights, like their right to express themselves. However, despite the existence of safeguards, states are more than likely to go above and beyond in some way, regardless of the magnitude (Roy, 2015).

In India, which has more than 600 million internet users and is the largest market for Google and Facebook in terms of number of users, the conflict between the government and social media companies is getting worse (Jones, 2021).

It appears that the Indian government is growing increasingly illiberal in its control of social media. According to the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021, the government's efforts to address social media platform problems in India are codified in the rules themselves. Fake news, unbalanced representations of women, and violent language are just a few of the troubling issues that the new rules attempt to address in greater detail. Notification of illegal content to the government is permitted, however social media services are required to take reasonable steps to ensure that their platforms do not include illegal information. News and current affairs publications must also adhere to a code of ethics and be subject to government control, in addition to the above. It must also be possible for the government to track down the senders of private communications on social media platforms where doing so is necessary to defend national security or combat criminal activity on those platforms (Jones, 2021).

The limitations have been heavily criticised both in India and throughout the world as a result of this. As a result of the widespread use of social media sites such as Facebook, there are at least two significant human rights issues (Graciyal & Viswam,2018). Initial restrictions on permissible content are more stringent than the exceptions to freedom of expression permitted by international law and India's constitution; in addition, government's discretion to declare information unlawful raises the possibility of political debate becoming unacceptably censored, regardless of which government or political party is in power (Byrd, 2016).

The government's demand that service providers decode messages in order to identify their originators, which is what the government wants, may be an invasion of privacy as well. Under the standards, social media platforms, as well as other forms of

digital communication, are the topic of heated debate and disagreement. According to Indian digital media organisations, "the administration having the whole authority to regulate the content of news portals or publications would constitute a direct attack on the constitutional system as well as democracy itself (Chandra, 2017). Legal action has been brought against the new regulations' application to digital news sites, with The Wire serving as the lead plaintiff.

VI. CONCLUSION

It goes without saying that using social media as a means to exercise one's right to free expression and expression is a good idea. Due to the growing number of instances of social media platforms being exploited for illegal reasons, governments all over the globe have moved to tighten their controls over what individuals may say on them. Despite widespread support for legislative control over social media, legitimate concerns have been raised about the possibility of human rights violations as a result of such restrictions.

In order to prevent social media from becoming a source of conflict, regulation rather than restriction should be implemented. However, India's present cyber law is neither appropriate nor sufficient. When it comes to cyberspace security, an assessment of current IT rules indicates that the government has unaccountable and tremendous jurisdiction, according to the findings. However, simply monitoring social media abuse isn't enough to prevent it from occurring. As a result, a specific piece of legislation is required to regulate social media.

With this in mind, the government should establish a committee of technical professionals to investigate all of the many aspects of social media usage and misuse in order to provide recommendations on how to regulate it without jeopardising individuals' civil rights.

In India, the government has a real reason to be concerned about the effect of social media on the country's society. Social media platforms should also be held accountable for the harms they produce, and rules should be established for how they should conduct themselves on the internet. There is a narrow line to walk between adhering to one's values and being shunned from the lucrative markets through which private firms must venture. While it is possible to assume that today's social media site CEOs are apolitical for the sake of argument, this cannot be assumed of future CEOs. Furthermore, any action done by social media platforms during a political disagreement between the government and opposition parties would be viewed as partisan by the public at large.

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Machine Learning, Deep Learning and AI: What's the Difference ?

Abstract

a lot of different terms are used to describe new methods for processing data these days. Machine learning is used by one person, while artificial intelligence is used by another. While "cognitive" is the preferred term for some, others may still assert that they are engaged in deep learning. What does all of this mean?
Although many of these terms are related to one another and may overlap in some respects, there are some key distinctions that may be significant and may make it difficult to fully comprehend what people mean when they use these terms (assuming they are used correctly).
Our brief introduction to the meanings and origins of these terms and expressions is as follows:

Machine Learning

Machine learning, at its most fundamental level, is any type of computer program that can "learn" on its own without being explicitly programmed by a human. The concept that underpins the phrase dates back many decades, all the way back to Alan Turing's seminal 1950 paper "Computing Machinery and Intelligence," which included a section on his well-known "Learning Machine" that could deceive a human into thinking it was real.
Today, the term "machine learning" is used to describe a wide range of programs used in big data analytics and data mining. In the end, machine learning algorithms are the "brains" behind the majority of predictive programs, such as spam filters, product recommendations, and fraud detectors.

The distinctions between supervised and unsupervised machine learning, as well as ensemble modeling, which employs a variety of techniques, and semi-supervised learning, which combines supervised and unsupervised approaches, are expected to be well-known to data scientists.

In supervised learning, the user instructs the software to produce an answer from a labeled and known data set. For supervised learning tasks, classification and regression algorithms, such as random forests, decision trees, and support vector machines, are frequently utilized.
In solo AI, the calculations produce replies on obscure and unlabeled information. Unsupervised methods are often used by data scientists to find patterns in new data sets. In unsupervised machine learning, clustering algorithms such as K-means are frequently utilized.
A variety of technologies and programming languages, including Java, Python, Scala, and others, are utilized by data scientists to program machine learning algorithms. They can also accelerate the process by utilizing pre-built machine learning frameworks; While Apache Spark's ML lib library is now widely used, Mahout is an illustration of a machine learning framework that was prevalent on Apache Hadoop.

There is so much information about Machine Learning in general:

Computers are given the ability to learn without being explicitly programmed through the process of machine learning, which is at the intersection of statistics and computer science.
Machine Learning issues can be broken down into two broad categories: learning that is supervised and unsupervised.
An OLS regression is one example of a simple Machine Learning algorithm.

Deep Learning

A type of machine learning known as deep learning can make use of either supervised or unsupervised algorithms, or even both. Deep learning is not necessarily new, but it has recently gained popularity as a method for expediting the resolution of certain difficult computer problems, particularly in the fields of computer vision and natural language processing (NLP).
The representation learning (or feature learning) subfield of machine learning theory serves as the foundation for deep learning (all_is_magic/Shutterstock).
Deep learning models produce results more quickly than standard machine learning approaches by extracting high-level, complex abstractions as data representations through a hierarchical learning process. In plain English, a profound learning model will get familiar with the elements that are significant without help from anyone else, rather than requiring the information researcher to physically choose the relevant highlights, for example, the sharpness of ears found in feline pictures (since it some way or another consistently returns to feline pictures eventually).
The numerous layers that are incorporated into the deep learning models—typically neural networks—are what give the term "deep" its "deep" meaning. Each model layer in a convolutional neural network (CNN) can take input from the previous layer, process it, and then output it to the next layer in a daisy-chain fashion.
It was a CNN created by the DeepMind team at Google that famously defeated the human world champion of the ancient Chinese game of Go. Many interpreted this as evidence of the rise of deep learning.
Deep learning is utilized in numerous fields today. Deep learning, for example, is used to find things like STOP signs and pedestrians in automated driving. The tactical purposes profound figuring out how to recognize objects from satellites, for example to find protected or risky zones for its soldiers. Deep learning is naturally prevalent in the consumer electronics industry as well. Deep learning algorithms are used by home assistance devices like Amazon Alexa to learn your preferences and respond to your voice.
What about a real-world example? Imagine Tesla employing a deep learning algorithm to recognize STOP signs in its automobiles. The STOP sign's relevant properties, or features, would be identified by the ANN in the first step. The inputted image's features could be specific structures like points, edges, or objects. The ANN is capable of automatic feature engineering, whereas a software engineer would have to select the relevant features in a more conventional Machine Learning algorithm. The first hidden layer might learn to recognize edges, the second might learn to distinguish colors, and the third might learn to recognize more intricate shapes that are specific to the shape of the object we are attempting to identify. The deep learning algorithms would eventually learn from their own mistakes whether the prediction was accurate when fed training data or required adjustments.

To conclude:
A specialized subset of machine learning is deep learning.
An artificial neural network, a layered structure of algorithms, is the foundation of deep learning.
Deep learning requires a lot of data but doesn't require much human intervention to work properly.
Large training dataset requirements can be met with transfer learning.

Artificial Intelligence

Artificial intelligence, like deep learning and machine learning, is not new, but it is definitely experiencing a revival. Traditionalists are unhappy that the word is also being used in a new way. When Turing first came up with his test, the term "artificial intelligence" was mostly used to describe a technology that could broadly mimic human intelligence. In that sense, it was a far-off, futuristic thing, similar to how we perceive time travel today. In 2014, a computer passed the Turing Test for the first time.)For many, chatbots like Microsoft's short-lived "Tay" represent AI technology.

In today's world, any kind of machine learning program is referred to as artificial intelligence, or just AI. As a result, it is beginning to replace the terms "big data" and "advanced analytics" and "predictive analytics," which are its cousins. This probably bodes well for those who despise the term "big data."

However, there are some individuals who would rather use the term "AI" to refer to a more specific phenomenon that is capable of imitating many aspects of human intelligence and evolving into an independent entity. That may not be a bet you want to make, but we haven't reached that point yet and may never do. Mark Zuckerberg, CEO of Facebook, made the prediction one year ago that it would be five to ten years before we could develop an AI that could "actually understand what the content means." becoming "cognitive"

Although the terms "machine learning," "deep learning," and "artificial intelligence" all have somewhat distinct meanings, they are frequently used to refer to any contemporary method of processing big data. In this regard, it is susceptible to the unavoidable hype that is associated with genuine advancements in data processing, which the sector is most definitely enjoying at the moment.

However, some industry professionals use their own vocabulary rather than these terms at all. For example, IBM calls its work "cognitive computing." In point of fact, it went so far as to establish a brand-new department within the business known as Cognitive Systems; Its Power Systems division actually resides within Cognitive Systems (which will always irritate customers who just want their ERP system to run smoothly, thank you).

However, the IBM website provides a fairly succinct definition of cognitive if you look hard enough. According to Big Blue, "a category of technologies that uses natural language processing and machine learning to enable people and machines to interact more naturally to extend and magnify human expertise and cognition" are known as cognitive systems.

So here it is: When you consider how IBM is utilizing Watson to not only win at Jeopardy but also to "read" medical literature, it makes sense that cognitive is, in the opinion of IBM, the combination of NLP and machine learning. In point of fact, according to IBM, Watson has already been trained on six different kinds of cancer and will be trained on eight more this year.

Examples of AI

A great illustration of what can be done with artificial intelligence is self-driving automobiles.

A self-driving vehicle is essentially a machine that learns to drive similarly to humans (and perhaps even better). Due to the fact that it still requires some input from humans, it might not be what some people consider to be true machine intelligence. However, it does an admirable job of imitating human intelligence by utilizing image recognition to navigate roads and make crucial decisions.

Other examples of AI include:

- Robots used in manufacturing;
- Digital assistants that learn about your preferences;
- Smart home devices that can understand what you say and respond in context;
- Safety devices that can identify faces and classify them

Examples of Machine Learning

A well-known illustration of machine learning is image recognition. Consider how Facebook can identify your friends and how apps can suggest products based on what you see in a picture.
A lot of random images are fed into a machine learning algorithm as part of this software's training process. The algorithm is rewarded every time it successfully connects two distinct images using a reinforcement learning model. Machine learning systems become extremely adept at recognizing people and objects in images over time.
Other applications of machine learning include:

- Software for speech recognition
- predictive analysis
- translation

Examples of Deep Learning

Without deep learning technology, it would be impossible to create virtual assistants like Siri.A virtual assistant is essentially software that uses natural language understanding to perform the intricate task of interacting with a human.That can only be accomplished by employing a layered structure of machine learning algorithms that process new inputs and continuously learn the appropriate responses.
Furthermore, deep learning is used to construct:
• Products that automatically color images by first identifying the objects in them
• Automated disease detection using image data like MRIs
• Discovering new drugs by studying patterns in existing pharmaceutical products
• Recommender systems like those used by Netflix and Amazon

MACHINE LEARNING METHODS

In MC, learning involves building a model that is a good and useful approximation of the data and learning general models from data. Data is cheap and abundant; knowledge is expensive and scarce. These categories are based on how the developed system receives learning or feedback on learning. A crucial distinction is made between supervised and unsupervised learning among the various categories of machine learning:
• Machine learning supervised: The program is "trained" on a set of pre-defined "training examples," which make it easier for it to draw accurate conclusions from new data.
• Machine learning without supervision: The program is given a lot of data and has to look for patterns and connections in it.

2.1 Supervised Machine Learning In supervised learning, the computer is given examples of inputs that are labeled with the outcomes it expects to produce. The algorithm will be able to "learn" by comparing its actual output with the "taught" outputs to find errors and adjust the model accordingly using this approach. As a result, patterns are used in supervised learning to predict label values on additional unlabeled data. The creation of a precisely tuned predictor function h(x), which is sometimes referred to as the "hypothesis," is the ultimate objective in the majority of supervised learning applications. Using sophisticated mathematical algorithms, "learning" involves optimizing this function so that, given input data x (such as a house's square footage), it accurately predicts some interesting value h(x) (such as the house's market price).In the real world, x almost always stands for multiple data points. Therefore, a housing price predictor might take into account not only the square footage (x1) but also the number of bedrooms (x2), bathrooms (x3), floors (x4), year of construction (x5), zip code (x6), and so on. An essential part of ML design is choosing which inputs to use. However, it is easiest to assume that a single input value is utilized for the sake of explanation.

2.2 Unsupervised Learning In unsupervised learning, the data are not labeled, so the learning algorithm must find patterns in the data it is given. Methods for machine learning that make it easier to learn without supervision are especially useful because there are more unlabeled data than labeled data. The objective of unsupervised learning could be as simple as finding hidden patterns in a dataset. However, it could also have the objective of feature learning, which enables the computational machine to discover the representations required to classify raw data automatically. For transactional data, unsupervised learning is commonly used. Even if you have a large dataset of customers and their purchases, you probably won't be able to make sense of the similar attributes that can be derived from customer profiles and the kinds of purchases they make.

Methods of representation-learning with multiple levels of representation are called deep-learning methods. These methods are created by putting together simple but non-linear modules that each change the representation at one level (starting with the raw input) into a representation at a higher, slightly more abstract level. It is possible to acquire extremely complex functions by composing a sufficient number of transformations of this kind. Higher levels of representation enhance discriminating aspects of the input and eliminate irrelevant variations in classification tasks. The learned features in the first layer of representation typically represent the presence or absence of edges at specific orientations and locations in an image, which is an array of pixel values. Regardless of minor variations in the positions of the edges, the second layer typically finds motifs by spotting particular edge arrangements. Motifs could be assembled into larger combinations by the third layer, which would then detect objects as combinations of parts of familiar objects. The fact that these layers of features were not designed by human engineers is the most important aspect of deep learning: Using a general-purpose learning method, they are learned from data.

2.3 Supervised Instruction The most well-known type of AI, profound or not, is administered learning. Imagine that we want to develop a system that can categorize images according to whether they contain a person, a car, a house, or a pet. First, we collect a large set of images, each labeled with its category, of people, cars, houses, and pets. The machine is shown an image during training, and it produces an output that is a vector of scores, one for each category. Prior to training, it is unlikely that the desired category will receive the highest score of all categories. The error (or distance) between the output scores and the desired score pattern is measured by our objective function. The machine then reduces this error by modifying its internal adjustable parameters. However, problems like image and speech recognition necessitate that the input–output function be highly sensitive to specific minute variations (like the difference between a white wolf and a breed of white dog that looks like a wolf called a Samoyed) while being insensitive to irrelevant variations of the input, such as variations in the position, orientation, or illumination of an object or variations in the pitch or accent of speech. Generic non-linear features, such as those generated by the Gaussian kernel, can be used to enhance the power of classifiers, but they do not permit the learner to effectively generalize beyond the training examples. Good feature extractors can be hand-designed, but this requires a significant amount of engineering knowledge and expertise. However, if good features can be learned automatically through a general-purpose learning method, all of this can be avoided. The primary benefit of deep learning is this. We believe that deep learning will have many more successes in the near future because it can easily take advantage of increases in the amount of data and computation available because it requires very little manual engineering. This progress will only be accelerated by the development of new deep neural network architectures and learning algorithms. For certain applications, such as the fuzzy recognition of images' objects and patterns, deep learning is a highly effective supervised and (sort of) unsupervised machine learning method.

CONCLUSION

Due to limitations in data processing, machine learning models lack analytics performance; on the other hand, DL algorithms are able to function at scale, and recent hardware innovations have demonstrated that deep learning training can be drastically reduced to minutes. There is a lot more research being done in deep learning, and DL's

breakthroughs will have a big impact on diagnostics and driverless technology as well as retail and healthcare.

Predictions and complex tasks that cannot be easily described or processed by humans can be taught to computers through a technique known as machine learning. Statics and mathematical optimization are combined in this approach. Deep Learning, on the other hand, is a subset of machine learning that focuses on solving any problem even more narrowly, like at the neuron level.

Machine learning is one way to solve some problems in narrow AI, though it requires hand-coding. General AI is currently impossible, and narrow AI is extremely challenging. Deep Learning is an improvement on Machine Learning, which is still narrow AI. As a result, we might one day have general AI!

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Effect of the COVID-19 epidemic on health, education: Medical students' knowledge, attitudes, and practices regarding electronic learning

Abstract

Medical education and healthcare systems have been disrupted like never before by the COVID-19 pandemic. Lecturers are required to deliver lectures in a secure manner while also maintaining the integrity and continuity of the medical education process because the disease has the potential to cause conditions that are potentially life-threatening. As a result, it is critical to assess the suitability of online learning strategies for medical students and their usability. We wanted to provide an overview of the situation that medical students were in during the COVID-19 pandemic and learn what they knew, thought, and did about electronic medical education. A cross-sectional survey was conducted with students from over 13 medical schools in Libya. An online and paper-based survey was conducted using email and social media. The survey sought demographic and socioeconomic data, as well as information about medical online learning and electronic devices; situation regarding the COVID-19 pandemic's impact on medical education; mental health assessments; and e-learning of knowledge, skills, and attitudes.
In total, 3,348 valid questionnaires were retrieved. Sixty-seven percent of respondents disbelieved that e-learning could be implemented easily in Libya. Only 21.1% of respondents agreed that e-learning could be utilized for clinical aspects, while 54.8% of respondents disagreed and 24% were neutral, despite the fact that 54.1% of respondents agreed that e-learning can facilitate interactive discussion. Only 27.7% of respondents had participated in online medical education programs during the COVID-19 pandemic, and 65% reported using the internet to participate in study groups and discussions. There is no COVID-19 vaccine at this time. The pandemic will therefore undoubtedly continue to disrupt medical education and training. In light of the possibility of a second wave of virus transmission, we must take certain measures and make adjustments in order to lessen the impact that the COVID-19 outbreak will have on medical education and training. Online training and virtual clinical experience to lessen this disruption should be met with enthusiasm and support because the time for change is now. The involved experience that is provided in a climate that is safe could then follow these actions.

Introduction

In December 2019, the coronavirus disease 2019 (COVID-19) was first identified in Wuhan, Hubei Province, China. It has symptoms that resemble pneumonia. The virus quickly spread, resulting in a worldwide outbreak in China. On March 11, 2020, the World Health Organization declared it a pandemic worldwide [1]. On October 2, 2020, there were more than 34.3 million confirmed cases of COVID-19 worldwide and over 1,000,000 deaths associated with the virus in more than 180 countries [2, 3].

The Coronavirus infection has upset medical care frameworks and clinical instruction more than ever [4].Due to the exceptionally infectious nature of the infection, it has been hard to proceed with addresses not surprisingly, affecting the talk based and patient-based way to deal with clinical training [5].The Coronavirus pandemic stances huge difficulties for clinical schooling since it places people in danger of creating perilous circumstances. In addition, lecturers must deliver lectures safely while simultaneously ensuring the integrity and continuity of the medical education process. Due to the focus on Coronavirus patients, these issues have limited the availability of bedside showing potential opportunities for clinical understudies, which has reduced patient consideration. A fear that medical students may contract the virus during their training and spread it to the community is another obstacle [8]. Students are also expected to remain at home and adhere to social distancing guidelines. As a result, they are unable to complete their clerkships [6]. Clinical rotations have been discontinued for the purpose of medical education [7].Consequently, we must develop a medical education curriculum that offers students opportunities for ongoing learning and avoids delays brought on by the pandemic [9].

Methods

From May to June of 2020, we directed a cross-sectional overview. The overview included a survey that was sent to more than 13 therapeutic schools in Libya, which have over 12,000 therapeutic schools, either in a paper-based or online format via email and social media. These therapeutic schools' understudies were chosen as follows. Using Google Shapes, a specific address related to the enrollment status of remedial students and the name of the school they attended was used in the online version to ensure appropriate selection without recording recognizing information. In order to ensure that the right number of think about members were selected, the survey was distributed via individual emails or a Google Shape to specific social media groups that included therapeutic students. In order to guarantee the highest possible response rate, a neighborhood update was sent to potential respondents. Through medica, the paper form was distributed to therapeutic understudies.

Study tool

The basic demographic information of the participants, such as their sex, age, and marital status, was gathered for the survey, as well as common questions about their financial situation, staff, level of restorative instruction, inside relocation, health history, mental illness, and learning disabilities in the event that they were present. In addition, the survey asked about their involvement with restorative tele-education, including questions about their ability to use electronic devices, the type and quality of the web they used, the status of restorative education programs, the type of electronic device owners, the availability of advanced technology, the educational strategy of the university, and their experience using three-dimensional technology in therapeutic education.

In addition, participants were asked ten questions about their personal attitudes toward the pandemic, three questions about their personal opinions about the government's response to the pandemic, and three questions about their health about their medical education status during the pandemic, including their work status, the kinds of educational activities they participated in, and how COVID-19 affected their career plan. The survey also included a mental health assessment that measured levels of anxiety and depression. A depressed person with a score of 3 indicates high sensitivity [16]. Cronbach's alpha of 0.8 indicated that our study participants had a high level of internal consistency on the PHQ-2 scale. The two-item Patient Health Questionnaire (PHQ-2) that incorporates the DSM-IV criteria for depression was used to assess depressive symptoms [14]. This device has been approved in a previous report [15].With a Cronbach's alpha of 0.91, the GAD-7 scale had a high level of internal consistency among the people in our study. We used the General Anxiety Disorder-7 Assessment (GAD-7) for anxiety [17]. Scores of 15 are thought to indicate a high likelihood of experiencing anxiety disorder-related symptoms [18].

Statistical analysis

We used descriptive statistics to look at the characteristics and responses of respondents by using frequencies and percentages. Continuous variables were referred to as mean (standard deviation) or median (range) values, and categorical variables were referred to as frequencies and percentages, as needed. The distribution of the variables was not normal, as shown by the Kolmogorov–Smirnov test. The chi-square test was used to determine whether any of the variables were correlated with gender groups or clinical and non-clinical years. We utilized the Mann-Whitney U-test to identify differences between two groups of continues variables. The Spearman's rank correlation coefficient was used to look at how the knowledge, attitudes, and practice scores of the studied variables related to e-learning. We performed all of our statistical analyses with IBM SPSS 25.0.

Ethical approval

Ethical approval was granted by the Bioethics Committee at the Biotechnology Research Center of the Ministry of Higher Education and Scientific Research in Libya. All participants gave written consent without identifying data prior to participating in the study.

Results

Basic demographic characteristics

We gathered 3,348 completed questionnaires from medical students attending more than 13 Libyan medical schools. Based on the distribution of 4,500 paper questionnaires and messages, the estimated response rate was 74%. The majority of participants were female; There were 2,390 (71.4%) females and 958 (28.6%) males in the sample. Male and female participants differed significantly in mean age ($p = 0.021$), with a mean age of 21.87 (5.74) years. With 1,199 (35.8%) completed questionnaires, the University of Tripoli had the highest response rate, followed by the University of Benghazi with 448 (35.8%).Figure 1 and the S1 Table provide a summary of the distribution of responses among universities.

Fifth-year medical students made up a greater proportion of the respondents (732;21.9%), supported by students in their fourth year (582;17.4%). However, the educational level and a number of other characteristics of male and female respondents were significantly different.

Medical students' attitudes toward COVID-19

During the pandemic, the majority of students (59%) agreed to assist in hospitals. In addition, the majority of them (75 percent) believed that the pandemic and subsequent school closure had wasted their academic potential.53.4 percent agreed that the pandemic had affected their own health, and 51.8 percent were concerned about getting COVID-19 while they were training to be doctors.45.4% of respondents, on the other hand, stated that COVID-19 had no effect on their careers or future specialty training.40.3% of students thought that their medical professors had helped them through the pandemic. In addition, the majority of the 4.6% had purchased electronic devices for e-learning access. Each "true" or "false" Response received a score of either 1 or 0 for further analysis. From 12 (maximum) to 0 (minimum), scores varied. A cutoff score of 8 was thought to indicate a good level of practice, while a score of 8 was thought to indicate a bad level. There were 3,348 participants, out of whom 1,438 (42.9%) exhibited an adequate level of practice and 1,910 (57.1%) fell outside of this range.

Discussion

During the COVID-19 pandemic, e-learning was suggested as a platform for providing medical education. The goal of this study was to assess the knowledge, attitudes, and practices of medical students regarding e-learning. The sample included 3,348 medical students from all years and concentrated on roughly 13 university medical schools. By revealing an acceptable level of e-learning knowledge, attitudes, and practices, the findings demonstrated the usability of e-learning during the COVID-19 outbreak. Its ability to reach clinical students and alter clinical preparation is another feature of the discoveries. However, when it comes to using e-learning

platforms, a sizable portion of those surveyed admitted to running into financial or technical difficulties. They were also concerned about how e-learning could be used to provide clinical experience, especially in the final year of medical school, where classroom instruction at the bedside is heavily prioritized.
Medical students in Libya face a number of obstacles; As a result of the local conflict that has engulfed several cities, 40.5 percent of respondents reported experiencing financial difficulties, and 11.8 percent of respondents reported having been internally displaced from their homes. Additionally, local governments should try to lessen the negative effects of the civil war and facilitate the educational process by providing financial assistance to students and their families. In addition, governments ought to provide specific financial and information technology support for students in order to enable them to access low-cost and simple-to-use e-learning platforms, taking into account the financial repercussions of the Libyan civil war that would have an impact on all of the aforementioned interventions.
56.8% of participants said they relied on private educational institutions for their education, while the majority (66.8%) said they studied independently and used a variety of educational resources. It is interesting to note that roughly a third of the students relied on lectures from the university. Due to their reliance on private instruction and student absenteeism from classes, many universities around the world are concerned. These issues can be explained by students' lack of interest and the teaching method, especially the traditional one, which requires students to listen to repetitive lectures with little opportunity for discussion and visual stimulation. Due to the boredom they experience during lectures, students are less motivated to attend subsequent lessons [28]. Students who live in a different city may have transportation issues, and private institutes may offer access to multiple tutors, making learning easier.

The implication for policy and practice

One of the suggested solutions was case-specific interactive online discussions. In this approach, students are given a weekly set of immersive online cases to model a clinical role. Following that, they use an online platform to present the patient's history, findings from the physical examination, findings from the investigations, and proposed treatment plans. After that, students can ask questions via a specific online platform while a teaching physician talks about the topic in an online webinar. This visual interface will be used to replicate instruction at the bedside [37].
Another approach that has been suggested for addressing the difficulties that are associated with medical education is to make use of telemedicine, which has been around for a number of decades. Because it is simple to provide and allows for connectivity without the risk of infection transmission, virtual clinical experience may benefit patients [4]. Telemedicine, which involves a virtual visit rather than an in-person clinical visit, has the potential to significantly assist medical students in gaining clinical experience by allowing them to interact with real patients under the supervision of attending physicians. A recent study on emergency medical clerkships [13] found that students' positive feedback regarding a virtual clinical experience that involved direct participation in patient care under the supervision of clinicians was found. However, this strategy requires additional evaluation and support before it can be officially implemented in medical schools. In our study, only 21.1% of participants agreed that e-learning should be used for clinical aspects, and 54.8% disagreed. It would be beneficial for doctors to be able to treat patients with severe and chronic conditions and to have less work to

Limitations

We found that the majority of medical students could use and access electronic devices in this study. Our findings indicate that medical students' knowledge, attitudes, and practices regarding e-learning varied. Our study, on the other hand, was conducted in a single nation with particular circumstances. As a consequence of this, it's possible that the results won't apply to other nations; More research in a variety of countries and institutions is required to verify the claims made about the online learning platform's effectiveness as a teaching method. If replication studies are conducted in multiple contexts, e-learning may be able to replace traditional medical lectures and provide solutions for the disruption of clinical training.

The cross-sectional nature of the review plan also hampered our ability to ascertain causal relationships. This demonstrates the significance of conducting international longitudinal studies. It would be difficult to distinguish the isolated effects of COVID-19 on the study variables given the particular circumstances of Libyan medical students in terms of the impact of the ongoing civil war, internal displacement, socioeconomic issues, and health-related issues. This is another limitation of the study. These variables may have confused how the COVID-19 pandemic affected Libyan medical students.

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Machine Learning: Algorithms, Real-World Applications and ResearchDirections

Abstract

Data from the Internet of Things (IoT), cybersecurity, mobile, business, social media, health, and other areas are abundant in the digital world during the Fourth Industrial Revolution, also known as Industry 4.0. Knowledge of artificial intelligence (AI), specifically machine learning (ML), is essential for conducting an intelligent analysis of these data and creating the intelligent and automated applications that are required. In the area, there are a variety of machine learning algorithms, including reinforcement learning, supervised learning, unsupervised learning, and semi-supervised learning. In addition, deep learning, which belongs to a larger family of machine learning techniques, is capable of intelligently analyzing large amounts of data. We provide a comprehensive overview of these machine learning algorithms in this paper, which can be utilized to boost an application's intelligence and capabilities. As a result, the main contribution of this study is that it explains how various machine learning techniques work and how they can be used in a variety of real-world application fields, like cybersecurity systems, smart cities, healthcare, e-commerce, agriculture, and many more. Based on our study, we also draw attention to the difficulties and possible directions for future research. From a technical standpoint, the overall goal of this paper is to serve as a reference for professionals in academia and industry, as well as decision-makers in a variety of real-world situations and application areas.
Keywords Machine learning · Deep learning · Artificial intelligence · Data science · Data-driven decision-making ·Predictive analytics · Intelligent applications

Introduction

Everything around us is connected to a data source, and everything in our lives is digitally recorded [21, 103]. We live in the age of data. The IoT data, cybersecurity statistics, smart city information, business facts, smartphone data, social media figures, health data, COVID-19 data, and many more examples can be found in today's electronic world. The data can be structured, semi-structured, or unstructured, as briefly discussed in Section. Machine Learning Techniques and Real-World Data Types," whose number is steadily rising. Insights gleaned from these data can be used to create intelligent applications in various fields. The relevant cybersecurity data, for instance, can be utilized to construct a data-driven automated and intelligent cybersecurity system [105]; The relevant mobile data can be utilized to construct personalized context-aware smart mobile applications [103], and so on. As a result, the real-world applications rely on the data management tools and techniques that are capable of intelligently and promptly extracting insights or useful knowledge from the data.

In the field of data analysis and computing, which typically enables applications to operate intelligently, artificial intelligence (AI) and machine learning (ML) have grown rapidly in recent years [95].ML is generally referred to as the most popular latest technology in the fourth industrial revolution, also known as Industry 4.0 [103, 105]. It gives systems the ability to learn and improve from experience automatically without being specifically programmed. The term "Industry 4.0" [114] refers to the ongoing automation

of conventional manufacturing and industrial practices, such as exploratory data processing, made possible by cutting-edge smart technologies like machine learning automation. Therefore, if these data are to be intelligently analyzed and the corresponding real-world applications are to be developed, machine learning algorithms are absolutely necessary. Learning algorithms fall into four main categories: supervised, unsupervised, semi-supervised, and reinforcement learning are all briefly discussed in Section [75]. Methods for Machine Learning and Real-World Data Types. The specific dates are depicted on the x-axis of the figure, and the correlating popularity score, which ranges from 0 (minimum) to 100 (maximum), is depicted on the y-axis.1, based on data collected over the course of the previous five years from Google Trends [4].These learning styles' popularity indication values were low in 2015 but are steadily rising, as shown in Fig. 1.These figures motivate us to direct research in this paper on AI, which might essentially affect this present reality because of computerization achieved by Industry 4.0.

The nature of the data, its characteristics, and the performance of the learning algorithms all play a role in determining a machine learning solution's effectiveness and efficiency. Data clustering, feature engineering, dimensionality reduction, association rule knowledge, and reinforcement knowledge are all instances of machine learning systems that can be rummage-sale to paradigm data-driven systems [41, 125].In addition, the artificial neural network, which is part of a larger family of machine learning approaches and is capable of intelligently analyzing data, is where deep learning got its start [96].As a result, it can be challenging to select a learning algorithm that is appropriate for the intended application in a particular domain. The reason for this is that different learning algorithms have different goals, and even different learning algorithms in the same category may produce different results depending on the characteristics of the data [106].As a result, it is essential to comprehend the fundamentals of various machine learning algorithms and how they can be utilized in a variety of real-world application areas, including IoT systems, cybersecurity services, business and recommendation systems, smart cities, healthcare and COVID-19, context-aware systems, sustainable agriculture, and many more, all of which are briefly discussed in Section. The Uses of Machine Learning"

This paper offers a comprehensive overview of the various kinds of machine learning algorithms that can be utilized to enhance an application's intelligence and capabilities. This is done in light of the significance of "Machine Learning" and its potential for data analysis. Therefore, the primary contribution of this study is the explanation of the fundamentals and potential of various machine learning techniques, as well as their suitability for the various previously mentioned real-world application fields. As a result, the goal of this paper is to provide a foundational guide for people in academia and industry who want to study, research, and create data-driven automated and intelligent systems based on machine learning in the relevant fields.

The following is a list of this paper's most significant contributions:

To characterize the extent of our concentrate by considering the nature and attributes of different kinds of true information and the abilities of different learning techniques.

to present a comprehensive understanding of machine learning algorithms that can be used to boost a data-driven application's intelligence and capabilities.

to talk about how machine learning-based solutions can be used in different real-world application fields.

to draw attention to and provide a synopsis of the potential directions for upcoming research on intellectual data examination and services within the choice of our learning.

The lasting parts of the paper are organized as follows: The types of data and machine learning algorithms are discussed in greater detail and the scope of our research is defined in the following section. In the following section, various real-world application areas based on machine learning algorithms are discussed and summarized, followed by a brief discussion and explanation of the various machine learning algorithms. This paper comes to a close in the final section, where we discuss a number of research issues and possible future directions.

Types of Real-World Data and MachineLearning Techniques

Data is typically consumed and processed by machine learning algorithms in order to discover related patterns about individuals, business procedures, transactions, events, and so on. We'll go over a variety of real-world data types and machine learning algorithm subcategories in the following sections. Unstructured data can be categorized as a number of different kinds of business documents.

Semi-structured: Although semi-structured data is not stored in a relational database like the above-mentioned structured data, it does possess some organizational features that make it easier to analyze. Documents in HTML, XML, JSON, NoSQL, etc., are a few examples of data that is semi-structured. Metadata: It is not the usual type of data; rather, it is "data about data. "The essential contrast among "information" and "metadata" is that information are just the material that can characterize, measure, or even report something comparative with an association's information properties. Metadata, on the other hand, is more important to data users because it describes the relevant information in the data. The author, file size, date the document was created, keywords to describe the document, and so on are all basic examples of metadata for documents.

Researchers in the fields of machine learning and data science employ a variety of widely used datasets for a variety of purposes. These include cybersecurity datasets like NSL-KDD [119], UNSW-NB15 [76], and ISCX'12 Machine Learning algorithms are generally categorized into four groups: As depicted in Fig., unsupervised learning, semi-supervised learning, and reinforcement learning, supervised learning 2. In the following, we will provide a brief explanation of each kind of learning strategy along with the scope of how they can be used to solve problems in the real world.

Supervised: Typically, supervised learning involves learning a function that maps an input to an output using sample input-output pairs [41]. In order to infer a function, it makes use of a collection of training examples and labeled training data.

It is typically utilized extensively in a variety of fields, including image and video recognition, image processing and classification, medical image analysis, and natural language processing, among others, because it makes use of the two-dimensional (2D) structure of the input data. CNN is regarded as being more powerful than conventional ANN due to its advantage of automatically detecting the most important features, despite its greater computational burden and lack of need for human intervention. In the field, AlexNet [60], Xception [24], Inception [118], Visual Geometry Group (VGG) [44], ResNet [45], and other advanced CNN-based deep learning models can be utilized.

LSTM-RNN: Long momentary memory (LSTM) is a fake repetitive brain organization (RNN) architecture utilized in the space of profound learning [38].In contrast to conventional feed-forward neural networks, LSTM has feedback links. In contrast to other conventional networks, LSTM networks excel at analyzing and learning sequential data, such as classifying, processing, and predicting data based on time series data. As a result, LSTM can be utilized when the data are presented in a sequential format, such as sentence, time, etc., and utilized frequently in time-series analysis, natural language processing, speech recognition, and other related fields.

Notwithstanding these most normal profound learning (Net) including numerous convolution and pooling layers.

Long Short-Term Memory Recurrent Neural Network (LSTM-RNN) (CNN, or ConvNet) [96].We'll go over a variety of deep learning techniques that can be used to create useful data-driven models for a variety of applications in the following sections.

MLP:A multilayer perceptron (MLP), also known as the feed-forward artificial neural network, is the fundamental structure of deep learning [82].As can be seen in Fig., a typical MLP is a fully connected network with an input layer, one or more hidden layers, and an output layer.10.At a certain weight, each node in one layer connects to each node in the next layer.The most "fundamental building block" in a neural network, the "Backpropagation" technique [41], is used by MLP to internally adjust the weight values as the model is built.MLP can be computationally expensive because it is sensitive to scaling features and can be tuned for a variety of hyperparameters like the number of hidden layers, neurons, and iterations.

ConvNet or CNN:As can be seen in Fig., the convolution neural network (CNN) [65] enhances the standard ANN design by including convolutional, pooling, and fully connected layers.11.methods, as well as a number of additional deep learning approaches [96] for a variety of uses in the field.For instance, the self-organizing map (SOM) [58] uses unsupervised learning to reduce the dimensionality of high-dimensional data by representing it on a 2D grid map.Another widely used learning technique in unsupervised learning tasks for dimensionality reduction and feature extraction is the autoencoder (AE) [15].Dimensionality reduction, classification, regression, collaborative filtering, feature learning, and topic modification are all possible applications of restricted Boltzmann machines (RBMs) [46].A back propagation neural network (BPNN) and simple, unsupervised networks like restricted Boltzmann machines (RBMs) or autoencoders typically make up a deep belief network (DBN) [123].A type of deep learning network known as a generative advertisement network (GAN) [39] is capable of producing data that resembles the actual data that is being input. Transfer learning is currently very common because it can train deep neural networks with relatively little data. Typically, this is done by resolving an existing problem using a model that has already been trained [124].Our previous paper, Sarker et al., provides a synopsis of these artificial neural networks (ANN) and deep learning (DL) models.96].
Overall, we can draw the conclusion that various machine learning techniques, such as classification analysis, regression, data clustering, feature selection and extraction, dimensionality reduction, association rule learning, reinforcement learning, or deep learning techniques, can, depending on their capabilities, play a significant role for various purposes. Several machine learning algorithm-based application areas are discussed in the following section.

Challenges and Research Directions
A number of new research questions in the field are raised by our investigation into machine learning algorithms for intelligent data analysis and applications. As a result, the difficulties encountered, potential research opportunities, and possible future directions are all discussed and summarized in this section.

As a general rule, the viability and the effectiveness of an AI put together arrangement depend with respect to the nature and qualities of the information, and the exhibition of the pick-uping calculations.to collect data in the relevant fields, such as cybersecurity, the Internet of Things, healthcare, and agriculture, which are discussed in Section Despite the fact that today's cyberspace enables the production of a large amount of data at a very high frequency, "Applications of Machine Learning" is not simple. Therefore, it is essential for further analysis to collect and manage useful data for the intended machine learning-based applications, such as smart city applications. As a result, when working with real-world data, a more in-depth investigation of data collection techniques is required. Outliers,

ambiguous values, missing values, and otherwise meaningless data may also be present in the historical data. The quality of the data as well as its availability for training have a significant impact on the final model, as discussed in Section "Machine Learning Tasks and Algorithms. "As a result, it is challenging to precisely clean and prepare the various data gathered from various sources. As a result, in order to make use of the learning algorithms in the relevant application domain, it is necessary to either effectively modify or improve existing pre-processing methods or to propose new data preparation methods.

Conclusion

We have provided a thorough overview of machine learning algorithms for intelligent data analysis and applications in this paper. We have briefly discussed, in accordance with our objective, the various machine learning methods that can be used to find solutions to real-world problems. Both the quality of the data and the learning algorithms are crucial to the success of a machine learning model. Before the system can assist with intelligent decision-making, the complex learning algorithms must first be trained with real-world data and application-specific knowledge. In order to demonstrate how machine learning techniques can be applied to a variety of real-world problems, we also discussed several well-known application fields. In conclusion, we have discussed and summarized the difficulties encountered, as well as potential research opportunities and future directions in the field. As a result, the challenges that are found open up promising research opportunities in the field that require efficient solutions in a variety of application areas to be addressed. Overall, we believe that our research on machine learning-based solutions points the way in a promising direction and can serve as a technical reference for potential research and applications for professionals in academia and industry as well as decision-makers.

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MICROCHIP IMPLANT IN HUMANS

Abstract
The goal of this study was to find out how people feel about microchip implants in humans. The risks associated with the microchip implant are the primary focus of the brief report. A research question was formulated to answer the purpose: How do people in Bors, who are between the ages of 18 and 30, feel about microchip implants and the risks they pose to their daily lives and society? Two studies—one qualitative and one quantitative—are used to construct this study. Qualitative interviews with six different people were the study's first step. The subsequent step, the quantitative survey, was based on these interviews.100 people were asked to fill out a questionnaire for the quantitative survey. The outcome demonstrated that the respondents lacked knowledge of human microchip implants and held a wide range of perspectives on the technology. Some people thought the risks were a big threat, while others thought they were less of a threat. The majority of participants, in the end, were against microchip implants in humans and would not be chipped. The results showed that people between the ages of 18 and 30 generally held the same views regarding the dangers mentioned in scientific theories and articles.

Keywords: Microchip, Implant, RFID, Biohacking, Chip, Risks

Introduction

People want to live a life that is simple and easy every day. In today's world, it is becoming increasingly common for individuals to implant microchips into their own bodies for the sole purpose of making their day-to-day lives easier. According to Forskning 2019, a microchip is now implanted in the bodies of over 5,000 people in Sweden. An integrated circuit is another name for the Microchip. A microchip is made up of four parts: capacitors, transistors, diodes, and resistors According to National Encyclopedia 2019, each of the four parts is integrated and placed on a tiny disk known as a microchip.

Radio-frequency identification (RFID) is the name given to the human microchip. One RFID chip, which can store a lot of data and be used for many things, is implanted beneath the skin. A single, unique code connects the RFID chip to the system. Since RFID is a passive chip, it only receives power when it connects to a reader; otherwise, the chip lacks electronic power and cannot transmit signals. It is difficult to track the chip due to its passive nature (Biohacking, 2019).This technology can be used as keys for a variety of payments, such as at SJ (the state's railways), and it is likely to advance in the future to prevent aging, allowing individuals to live longer. According to Forskning

(2019), the practice of "biohacking," or altering one's body, is becoming more widespread and more common by the day. According to Forskning 2019, biohacking is derived from transhumanism, a philosophy that advocates and works toward improving our mental and physical characteristics.

Background

Humans have historically advanced technology to new heights.Nearly all electronic devices contain integrated circuits, and after electronic devices, microchips began to be implanted in animals like cats and dogs (Sime, 2016).

Problem discussion

New problems can arise as a result of the new technology used to implant microchips into humans (Randall, 2012).Costs, health risks, privacy, robbery, and tracking and monitoring are among the problematic areas that the report will address.

The possibility of being hacked is one major issue.Hackers can learn how to hack while the chip is being developed so they can steal sensitive information from victims' microchips.By fostering their own abilities while, following the improvement of the chip, there may be plausible of the programmers figuring out how to get their hands on the delicate information in a simpler manner (Randall 2012).The integrity alien is yet another issue.This may present a challenge due to the potential for all data to be collected in the same location when users use their microchip in the future.This can make it possible for the wrong people to access all of your personal data, not just some of it (Gadzheva, 2007).One of the theoretical framework's most frequently mentioned risks is tracking and monitoring, which are also significant issues.The user has no idea who monitors the RFID chips, and information about them can be easily obtained (Rodriguez, 2019).Since tracking is another aspect that can also be obtained from various actors in society, it is a topic that is even more sensitive due to the fact that it is hidden from view and is subject to constant surveillance.In the event of a robbery, having a valuable device concealed will increase the likelihood of injury.If a thief decides to rob you while you are wearing a microchip, they must remove the chip from inside your hand.The incident may harm one's mental and physical health. Because the chip does not need to be used by a person, robbery is very risky, especially if someone uses violent means to steal your personal information by taking the chip out of your arm (Gadzheva, 2007).

Limitations

The risks associated with human microchip implants are the focus of this study; otherwise, the investigation would be too extensive. The study's other limitations include: the age of the target group and the location of the study. Another point worth mentioning is that the findings of this study are based on the knowledge and opinions of the participants.

Methodology

This examination contains a subjective and a quantitative investigation where the design was to see what individuals between the ages 18 to 30 years of age hold as sentiments and understandings about getting a computer chip executed into the human body. According to Recker (2012), the use of a triangulation method results in a survey that is more trustworthy.

Research design

This section begins with a description of the research design. Chapters 4 and 5, where the studies are presented, will explain the specific methods. The research design has two themes: deduction and induction. Both an inductive and a deductive design were used in this study. According to Racker (2012), an inductive design is one in which the specific observations of the researcher are analyzed in terms of patterns and commonalities in order to connect and develop to theories studied. Theories can

be constructed from the observed data; Essentially, the studies serve as the foundation for the theories.

A case study is a method of research that can be used to clarify a context situation called a "case." The technique is for a solitary case or a couple of additional connected cases. According to Colin (2002), this approach focuses on gaining a deeper comprehension and conducting an in-depth analysis of a single case—or a number of related cases—about which you wish to acquire additional knowledge. As a case study, the qualitative strategy was used, and the qualitative data came from the interviews' responses. The qualitative data were used to create a study. The purpose of the qualitative study was to improve comprehension and knowledge of the opinions of the interviewees as well as develop high-quality survey questions. The subsequent study is described as employing a quantitative approach (Recker, 2012).

Respondents for both studies

It gives a picture of how the first "real" generation thinks to only ask the carefully selected target group. People in this age group will be most affected by the development of microchip implants, so their opinions are the focus. In Bors, the intended audience consists of men and women aged 18 to 30.This audience is important because they will be affected and will be the "first real" generation to use a microchip in their body.

Ethical considerations

The participant's ethnicity and country of origin may affect their responses. This may present a challenge when it comes to cultural and religious ethical considerations. Each participant has their own opinion, and since each participant comes from a different background and has different life values, their response may differ. The final outcome is significantly influenced by each participant. When the answers have been analyzed, these aspects should be taken into consideration and mentioned.

Theories

A review of the relevant literature serves as the foundation for the topic's theories, as does technology that is comparable to microchip implants.

Literature review

The vitally material comes from logical articles with dependable sources that guarantee the contentions in the work. Throughout the research, key words like "microchip," "implant," "RFID," "biohacking," "chip," and "risks" were used to find relevant sources for the literature review. Additionally, relevant facts about the microchip and its effects on individuals and society as a whole were examined in newsmagazines and websites. The sources are reliable and have extensive knowledge. Even though none of the information comes from scientific articles, all of the sources are based on research conducted by people who are involved in the subject in some way. Some of the data comes from research institutes where the researchers write articles on the subject of their work. Research articles and websites can never be guaranteed to be of the same quality as scientific articles. Security concerns are an immense point as per the execution of CPUs into human bodies. It has been argued that it is possible to clone an implemented chip by using a reader to collect the information and then making another one that is identical by those who are opposed to it on technical grounds. Then, someone else has access to all of your personal information and can win using your chip (Gadzheva, 2007).There is a concern that microchip implants may one day serve as a means of controlling, monitoring, and regulating individuals. It is possible for parents to decide to give their children a microchip. Implementing an RFID chip on psychologically ill patients is another example. Coercion of individuals to implant a microchip may, in some instances, yield positive results; however, this is an ethical issue that must be criticized and adapted to society through the

implementation of stringent regulations (Monahan, Fischer, 2010).

Comparing the two studies

Because these were the two steps required to obtain a result that could be presented as an answer to the research question, the two studies had been very important to the study.Because the two studies were of different sizes, any comparisons between them would have to be made in percentages due to the different numbers that were asked.

Conclusion

It is possible to answer the research question and draw some conclusions about it by combining the two conducted studies with previous theoretical framework and research. The research question for this study is:

What is the opinion about microchip implants in humans for 18-30-year-old people inBorås, when it comes to risks in their daily life and the society?

The following conclusion could be drawn from the findings of the studies:
Knowledge:The majority of people who took part in the studies said they were interested in the idea of microchip implants in humans and had heard about them. However, they didn't know much about them.
Oppositional opinions:The majority of respondents have negative perceptions of the technology.Their point of view was that they wouldn't put a microchip in themselves.
detrimental to the body:A divided opinion is harmful to the body. It is viewed as the greatest risk by one segment of the target audience, while another segment views it as the complete opposite and does not believe it would harm the body.
Hacking and following: According to the target audience, hacking, tracking, and being monitored are the most obvious dangers associated with microchips. Because these are the risks that people are most concerned about, and because these risks are related to integrity, it is possible to draw the conclusion that the greatest risk associated with microchip implants in human bodies was integrity.
Necessity: Despite all of the risks that have been mentioned, the majority of the target audience does not appear to consider microchips to be a useful tool for everyday life.

Integrity can be referred to collectively as being hacked, tracked, and monitored. One aspect that is shared by both the two studies in this study and the theories is integrity. People and society as a whole appear to be more afraid of mental injuries than of physical ones. An individual who suffers from mental illness runs the risk of constantly being watched, being hacked, and losing their personal integrity. Physically harmed, for instance, refers to harm to the body. The divergent perspectives on the subject held by social actors and the media are one factor that may have an impact on the people's feelings.
To compare the opinions of the participants, the facts, and the theories about the subject, determine whether the results are comparable in terms of the risks associated with chipping or not. As a result of this study, the facts used and presented can be interpreted as matching the opinions of 18- to 30-year-olds.

Further research

This research is quite extensive, and we believe that we could only have delved deeper into a few aspects, such as the integrity aspects of being hacked, monitored, and tracked. We recommend additional qualitative in-depth studies of the subject, including those on knowledge, negative opinions, harmful to the body, hacking, tracking, and last necessity, as further research. An in-depth study may be possible rather than additional data collection. The grounded theory's two steps of axial

and selective coding are used in an in-depth study, which includes a deeper analysis.
Since the thesis did not contain relevant information that would have helped or strengthened the result, other aspects have not been mentioned in this report but may still be of interest to other parties. For instance, the survey did not find any benefits because, as the thesis claims, the focus was on risks. However, this does not rule out the benefits being intriguing. It was merely a feature that was not included in this survey.
This study provided an answer to the research question of how people feel about a new technology that is still quite foreign to people who have never used microchips. As a result, there was a greater interest in repeating this study in the future, when chipping is more accepted and commonplace in our society and when the chip could be used for payment and keycard applications. This technology can be compared to, for instance, the internet, which just appeared and quickly gained dominance. People didn't think it was necessary and were a little skeptical about it. Later, the world was dominated by the internet. We have no idea, but it's possible that the chip will have a similar impact on individuals and society in the future if it becomes more widespread and accepted like the internet did.

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School students : use of electronic devices and socialmedia

Abstract
This study examines Abu Dhabi children in sixth grade or higher use of social mediaapps and devices, parental involvement, and knowledge. It investigates the use of social media-related apps and personal computers by young children. The purpose ofthis paper is to investigate the reasons behind people's online social network membership. It looks into what parents know about these activities and how likely they are to be invited to social gatherings with their kids. More than 31,000 children from both public and private schools completed the online survey. According to the findings, 91.7 percent of households have high Internet access. Children reported using social media primarily for information-seeking and family communication.82% of children indicated that their parents were aware of their online social networking activities, and 38% of respondents indicated that their parents were a part of their online social networking friend group. Time spent on social networks is negatively correlated with students' perceived performance in particular subjects. The implications of gender, grade (or age), and type of school arealso discussed in the paper.

Keywords : Social media, Social networking, Parental knowledge, School children,Abu Dhabi

1 Introduction

Increased evidence (Goh et al.) has raised concerns regarding the developmental effects of these activities. According to Turow (1999), parent surveys indicate that many parents purchase home computers and subscribe to Internet access in order to provide educational resources for their children. 2003, DeBell and Chapman; 2006, Greenfield and Yan; 2008 Livingstone and Haddon; (Henderson 2011,Additionally, Rosen et al.)Willett, Wilson, and others (2005) show that children's susceptibility to the influence of the media can vary depending on their gender and age, and they conclude with recommendations for assisting parents in maximizing the positive effects of the media while minimizing the risks associated with particular types of content's research indicates that children's use of social media has significantly increased. For Abu Dhabi families, El Khouli (2013) emphasized the significance offamily involvement in monitoring these negative aspects of social networking. In itsmost recent report, The Global Mideast Insight (2016) mentioned that social media is used for communication, connecting with friends, family, and others with similar

interests, as a news source, and even to organize large events in the Emirates. Somebusiness owners use it as their entire advertising platform.

The current investigation ought to be regarded as a preliminary examination of the intricate dynamics of social media use among children in Abu Dhabi.It will provide an accurate, complete, and up-to-date account of social networking practices, as well as parental involvement in these activities and knowledge of their children's participation inthem.

2 Literature review

2.1 Uses of digital devices among children

Children use home computers for a variety of activities, including playing games andbrowsing the web, as well as for schoolwork, according to the Pew Internet and American Life Project 2002.2000, Shields and Behrman; De Bell and Chapman (2003), a National Center for Education Statistics study, found that 23% of nursery school students use the Internet, with children between the ages of 5 and 9 using it the most frequently. The results indicate that approximately 11.7 percent of respondents did their homework, while 20.5 percent spent their time playing video games. Roberts and co. A 2005 study found that children between the ages of 8 and 10 are the most likely of all age groups to have a video gaming device in their bedroom, where they spend about one hour a day playing games. However, childrenunder the age of 3 or 4 are most likely to watch videos online (Child wise 2012; 2012;Findahl; Teuwen and co. 2012).

2.2 Children time and uses of social networks and their academic performance

The effect of social media use on academic performance has been the subject of numerous surveys., Our survey was conducted among business students at a large state university. Paul and others (2012) used structural equation modeling to show that students' academic performance is negatively correlated with their time spent ononline social networks. Facebook use has a negative impact on GPA and weekly study time, according to Kirschner and Karpinski (2010).Regression analysis was used by Karpinski and others (2013) to show that daily social media use negatively predicted overall GPA.

2.3 Children's perceived effects of using digital devices

Younger children (5–8) had a lower level of technical and social understanding of theInternet than older children, according to Yan (2005).According to their perception, the Internet did not appear to hinder children's learning.However, older children between the ages of 9 and 11 were aware that while the Internet can help with schoolwork, it can also generate negative thoughts.According to the Australian Department of Insights (2012), 79% of Australian children between the ages of 5 and8 use the internet on a daily basis.According to Ofcom (2012), young children makeup a significant portion of the market for portable innovations, using the Internet froma variety of devices, including touchscreen PC tablets, tablets, workstations, and smart toys.

2.4 Children's use of social networking

Teens' online time and parental control over their use of the Internet have been citedas causes for concern (Gross, 2004).2005. Young children may not fully comprehendthe potential repercussions of Web use and are at risk as they explore various virtualentertainment options (O'Keeffe and Clarke-Pearson, 2011).

2.5 Parental involvement and attitudes towards young children's usage

According to Wang and others (2005), parents are becoming more involved in their children's Internet use;Despite the risks, teens use the Internet for a variety of reasons.According to Haythornthwaite (2005), the fact that children typically use social networking sites without guidance or effective control reflects the difficulties that have a negative impact on family stability.According to Dodge and others (2011), more and more young children are using the Internet without adult supervision at least occasionally.However, according to Nikken and Jansz (2011), children from wealthyfamilies received slightly more supervision than children from poorer families, indicating that Dutch parents actively monitored their young children's Internet use.Changes in the media preferences of school-age children appear to indicate a greater degree of parental autonomy in decision-making, according to Davies and Gentle (2012).

2.6 Perceived differences among children

According to Boyd and Ellison (2007) and Lenhart et al.'s three criteria, However, girls use social networking sites more frequently and for longer periods of time thanboys do (Brenner, 2012; Rider out and co., 2010). This includes the fact that more girls than boys use Twitter and Facebook. As of 2014, Facebook and Twitter are thesocial networking sites that are most popular with teenagers and young adults of bothgenders. Despite changes in how teens use the Internet and social media over time, gender differences persist. Instant messaging was the most common activity among American middle- and high-school students, according to Gross (2004).In 2007, teenage girls were more likely than boys in the United States to blog. However, girlsare more likely to video chat and create and share more video links (Lenhart, 2012),consistent with their more active texting and mobile communication practices (Lenhart et al., 2010). The majority of teenagers in the United States today spend some of their free time visiting social media websites, according to the Pew Internetand American Life Project (2011). Boys, on the other hand, were more likely to use video sharing applications and upload videos online (Lenhart et al., 2007). Boys usecomputers

Cranmer and others Dodge and others Similar conclusions were reached in 2009 and2011, with the conclusion that Web wellbeing in the personalities of children betweenthe ages of 7 and 11 was a theoretical and poorly understood concept. Holloway et al. say that, Children's and young people's technological needs, uses, and interests aresignificantly influenced by age.

According to Info Comm Development Authority of Singapore (2010), approximately 85% of Singaporean households had Internet access. While studies onchildren's Internet use in Singapore focused on children aged 12 to 18 (Liau et al., 2005; Falsehood and other things, 2008),

Gender differences in Abu Dhabi's computer and technology use must be taken into account in any study due to the divergent outcomes of these studies.

By examining the extent to which parents monitor their children's use of digital devices, online social networking applications and tools, and Internet use among schoolchildren, this paper fills a gap in the literature.

3 Research methodology

3.1 Participants

Students from both public and private schools in Abu Dhabi took part. An online survey was used to collect the data. Compared to the face-to-face method, the onlineapproach made it possible to reach more students and locations. The Abu Dhabi Education Council (ADEC) Research Office sent a letter to all principals urging themto encourage students to take the survey and visit the ADEC homepage. The announcement for the survey was made available online for the month of January in2016.Together, 31,109 students completed the survey. There were 59 boys (51%) and57 girls (49%) among the students, who were in grades 6-12 and ranged in age from8 to 19 years old. Of those students, 59% were female and 41% were male.72.1 percent of students went to private schools, while 27.9 percent went to public schools.Understudies from 270 schools participated, and the percentage of students in grades6 through 12 was 18.1%, the percentage in grades 7 through 12 was 18.1%, and the
percentage in grades 9 through 12 was 17.6%.

Abu Dhabi, Al Ain, and Al Gharbia are the three zones that make up the Abu Dhabi. Abu Dhabi is the capital with a cosmopolitan flavor. Al Ain is the Abu DhabiEmirate's second-largest city. It houses a significant number of the most valuable cultural assets of the emirate, many of which relate to the culture and Bedouin roots of the national population. Al Gharbia has a wide range of locations and a low population density; Madinat Zayed and Ruwais have the most people living there. Table 1 gives a rundown of schools and understudies in every one of the three zones.

3.2 Objectives and procedures

All Abu Dhabi schools were invited to take part. The ADEC letter to schools requested permission from the principals. Additionally, all parents were contacted viaSMS to request their assistance in encouraging their children to participate. The children were informed that their participation in the interviews was voluntary and that they were assured of their confidentiality. The survey's primary objective was toaddress the various social networking difficulties faced by school students. The purpose of this survey was to obtain student feedback on Abu Dhabi's uses, effects, and related aspects of online social networking. The students were told in the openingletter that ADEC policymakers want to know what students do and how they feel about their experiences with online social media and networking. Additionally, it wasexplained that the resulting data will be used to enhance health and safety education for Abu Dhabi's youth.

5 Discussion

Admittance to the Web and Wi-Fi is moderately high.Children use mobile phonesand tablet PCs more than any other of the five devices.This might be because of theircomfort, accessibility and versatility.Nearly all of the students in this sample of Abu Dhabi schoolchildren have Wi-Fi and the Internet at home.Social networking is accessible via a variety of channels.On average, students spend 5.2 hours per day engaging in online social networking.If we contrast this number with comparable numbers based on global usage (Ofcom 2014), it is relatively high.

WhatsApp and Kik messenger are preferred by most children.Instagram, YouTube, Skype, and SnapChat are also popular with them.Students indicated that Facebook and Twitter were the websites they preferred the most in comparison to theresults of other studies (Sheldon, 2008;Young and Quan-Haase, 2010).

6 Implications

The importance of social networking has skyrocketed.In Abu Dhabi, mobile use has become an integral part of the lives of the majority ofchildren.Children's lives are significantly influenced by social networking sites.Over 81.7% of students indicated that they have at least one social networking profile.It is disturbing to take note of that numerous youngsters spend more than 5.2 h each day on informal communication locales.It may benecessary for parents to become more involved with their children and inquireabout how they use digital devices and social networking applications in theirdaily lives.Youth who participate in social networking sites may be presentedwith opportunities, but as with any activity, there are risks as well, and it is essential for parents to assist their children in making wise use of these platforms.

7 Limitations and future research directions

The number of private school students who responded to the call and took part is significantly larger than the number of public school students who responded.ADEChas some concerns about this result.In order to reach a larger number of public schoolstudents and encourage them to participate, future student surveys might try other novel approaches.

The findings of this study do not make it clear whether parents set specific rules or time limits for social networking use;and how frequently those regulations are followed.Future examination could attempt to look for more clear data.Future studiesshould also look into whether parents enforce different rules for different apps and gadgets at different times of day and on holidays.

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Secure Digital Voting System based on Blockchain Technology

ABSTRACT

Electronic voting, also known as e-voting, has been utilized in a variety of ways since the 1970s.E-voting has fundamental advantages over paper-based systems, such as reduced errors and increased efficiency. However, it is still challenging to achieve widespread adoption of such systems, particularly when it comes to enhancing their resistance to potential flaws. Blockchain is a new technology that has the potential to improve electronic voting systems' overall resilience. This paper presents a method for electronic voting that makes use of the transparency and cryptographic foundations of the blockchain. The proposed method satisfies the fundamental requirements for e-voting schemes and ensures verifiability from beginning to end. The Multichain stage is utilized to carry out the proposed e-casting a ballot conspire, which is portrayed exhaustively in the paper. The paper provides a comprehensive analysis of the plan, which successfully demonstrates its effectiveness in achieving an e-voting system that can be verified from start to finish.

Keywords: electronic voting, e-voting, blockchain, e-government, verifiable voting

INTRODUCTION

Elections are the foundation of a democratic system because they allow people to vote and express their opinions. Given their significance to our society, the election process ought to be transparent and trustworthy so that participants can be confident in its credibility. In this context, the method of voting has undergone continuous change. The majority of this evolution is driven by effortsto make the system secure, verifiable, and transparent. Given its significance, constant efforts have been made to improve the democratic framework's general proficiency and adaptability. This is largely due to electronic voting, or e-voting. Gobel et al. claim that2015), e-voting systems have come a long way since their humble beginnings in the 1960s as punched-card ballots. However, electronic voting systems must adhere to particular benchmark parameters in order to facilitate their widespread adoption. These parameters include the anonymity of the voter, the integrity of the vote, and non-repudiation.

Blockchain is one of the new technologies that allows applications to use these capabilities to create long-lasting security solutions because of its solid cryptographic foundation. Similar to a data structure, a Blockchain stores and disseminates all transactions made since its inception. It is mostly a decentralized, distributed database that keeps a complete list of data recordsthat can't be changed or manipulated by anyone else. This list is always growing. Every user has the ability to connect to the blockchain, send new transactions to the network, verify existing transactions, and create new blocks (Rosenfeld, 2017; 2015,Kadam et al.; 2009 Nakamoto). Each block

receives a cryptographic hash—also known as the block's fingerprint. As long as the data in the block does not change, this hash is valid.If any changes were made to the block, the cryptographic hash would immediately change, indicating that the data had changed, possibly as a result of malicious activity.

Due to its strong cryptography foundations, blockchain has become increasingly used to prevent unauthorized transactions ina variety of fields (Nakamoto, 2009; Kraft, 2015; 2015, Narayanan et al.).

While Bitcoin is still the most recognized application of blockchain expertise, researchers are keen to investigate how blockchain technology can be rummage-sale to simplify applications in a variety of fields by leveraging advantages like non-repudiation, integrity, and anonymity. Here in paper, we look at how blockchain can be cast-off to make it easier for e-voting applications that canguarantee voter anonymity, vote integrity, and end-to-end verification. We believe that e-voting can take advantage of fundamental blockchain features like the public availability of a disseminated journal of accounts and the self-cryptographic validation structure oftransactions (through hashes). Due to its characteristic landscape of preserving secrecy and maintaining a decentralized and publicly distributed ledger of transactions across all nodes, the blockchain technology has the potential to play a crucial role in the field of electronic voting. Because of this, blockchain technology is very good at dealing with the danger of using a voting token multiple times and trying to change the transparency of the result.

Our research focuses on the key issues of voter anonymity, vote confidentiality, and end-to-end verification. These obstacles serve as the foundation for an efficient voting system that preserves the integrity of the voting process. We discuss our efforts to investigate thepossibility of using blockchain technology to solve these issues in this paper. Particularly, the open-source blockchain platform Multichain (Multichain, 2017) serves as the foundational technology for our system, which is based on the Prêt à Voter method (Ryan,2008).In order to safeguard the vote's integrity and anonymity, the system uses information specific to each voter to generate a robust cryptographic hash for each transaction. This hash is also communicated to the voter via encrypted channels in order to facilitate verification. Rura et al. say that (2016), the system satisfies fundamental e-voting system requirements. Section 2 goes into greater detail about this.

The paper's remaining sections are as follows: The next section explains how our proposed system meets Rura et al.'s criteria for ane-voting system.2016). The current state of e-voting and our contribution are presented in Section 3, which is followed by a
comprehensive description of the design of the system in Section 4. The evaluation of the system, which focuses on how it fulfills therequirements outlined in Section 2, is presented in Section 5, along with the implementation of our proposed system with Multichain and user interface. The sixth section of the paper details the current state of things and plans for the future of work.

E-VOTING BACKGROUND AND REQUIREMENTS

For a long time, research has focused on the use of computing machines and equipment to cast votes and produce high-quality, preciseresults that reflect the sentiments of the voters who participated.In practice, numerous efforts to support the election process have beenmade.At first, voters could use a computer counting system to cast their votes on paper.These cards were then scanned and counted ona centralized server at each polling cell later (Kadam et al.,2015, Rockwell, 2017, and (2010)Later, Direct Recording Electronic (DRE) voting systems were implemented, which were greatly admired and acknowledged by voters despite opposition from computerscientists.If voters have a solid understanding of the voting system, it can be significantly improved in terms of usability.Particularly DRE frameworks have achieved a lot of success in convincing voters to use this technology.These systems work pretty much the same way as any other traditional election system.In the case of DRE, a voter begins his journey by going to their polling location andgetting a token to vote. At the voting terminal, the voter uses the token to vote for his candidate.In the event that a voter wishes to change his or her mind, DRE systems inform the voter of the final selection before the voter actually casts their ballot, and the ballot casting process is completed following the final selection (Multichain,

2017;2012, Dalia et al.).
Blockchain and other distributed ledger technologies have recently been used to implement e-voting systems, primarily due to their advantages in terms of end-to-end verifiability.Because it provides anonymity, privacy protection, and non-repudiation, blockchain is a very appealing alternative to the current e-voting systems.This paper's exploration likewise attempts to utilize theseblockchain highlights to make a viable e-casting a ballot framework.A comprehensive analysis of these systems and a comparison to these methods are provided in the following section.

e- Voting Necessities and Obedience by the Future System

In (Rura et al., 2016), the general requirements for a archetypal e-voting scheme were recognized. In addition to providing anexplanation of how the proposed system fulfills each requirement, we provide a brief description of it.

Privacy - Keeping an person's poll secret

To protect a voter's privacy, the system makes use of blockchain's cryptographic capabilities. More specifically, when a voter registerswith the system, the blockchain generates a voter hash, which serves as the voter's unique identifier and is protected from misuse by the collision resistance of the cryptographic hash. The traceability of a vote is also non-trivial as a result, safeguarding the voter against pressure.

Eligibility: Only registered voters can vote, and each registered voter can only vote once.

To protect a voter's privacy, the system makes use of blockchain's cryptographic capabilities. More specifically, when a voter registerswith the system, the blockchain generates a voter hash, which serves as the voter's unique identifier and is protected from misuse by the collision resistance of the cryptographic hash. The traceability of a vote is also non-trivial as a result, safeguarding the voter against pressure.

Freedom from receipts: Voters shouldn't be able to show a third party that they voted a certain way.

A cryptographic hash is generated for each such event (transaction) by the proposed system, which enables a voter to vote in accordance with their preferences. This is necessary to achieve verifiability, or determining whether a particular vote was counted.However, possessing this hash does not permit the extraction of voter voting information.

Accommodation - Electors should have the option to cast a ballot effectively, and each and every individual who isqualified should have the option to cast a ballot

The voting process only requires minimal user input thanks to the system's web-based, user-friendly implementation. Fingerprinting,for instance, is used as an authentication method to eliminate the need to remember usernames and passwords. In addition, the process as a whole is integrated, making it easy for the user to work with it.

Verifiability: is the capacity to rely on the counting of votes.

A cryptographic hash representing a user's unique transaction ID is given to them after they have successfully cast their vote. Thistransaction ID can be used by a user to see if their vote was included in the totaling process. However, this procedure, which was implemented to reduce threats when under duress, prevents users from viewing how they voted.

The above analysis highlights the proposed system's performance in relation to e-voting's specific requirements. It also emphasizes thesignificance of blockchain's defining characteristics and their significant role in establishing the foundations of an effective electronic voting system.
As a result, we believe that the research presented here significantly expands our understanding of how to use blockchain technologyto create a safe digital voting system.

RELATED WORKS

A self-tallying voting system that doesn't need any trusted third parties for vote aggregation or a private channel for voter-to-voter privacy is proposed in Kiayias & Yung (2002).There is a lot of computation involved in the proposed protocol.A two-round protocolthat computes the total in two rounds without using a private channel or a trusted third party is proposed by Hao et al. (2010).According to Dalia et al. (2012), the protocol is effective in terms of amputation and bandwidth consumption, but it is neitherfair nor robust under certain conditions.A protocol to enhance the two-round protocol's fairness and robustness is proposed by Dalia et al. (2012).According to Chaum et al. (2008), the authors of Shahandashti & Hao (2016) propose an E2E verifiable voting system called DRE-ip (DRE-i with enhanced privacy) to circumvent the limitations of DRE-i.During the voting process, DRE-ip encrypts the vote without first computing ciphertexts.DRE-ip provides a significantly stronger privacy guarantee than DRE-i while still

achieving E2E verification without the use of TAs.End-to-end verifiability is achieved by using the Mixnet protocol (Chaum, 1981),which randomizes the ciphertext through a chain of mix servers to recover the plaintext ballot (Chaum, 2004).

According to Chaum et al. (2008), scantegrity is a method for achieving end-to-end (E2E) verifiability through the use of confirmationcodes. These codes enable voters to demonstrate to themselves that their votes are included in the final tally precisely as they are.Another privacy-preserving method, Prêt à Voter, based on Chaum (2004), is proposed by Chaum et al. (2005). In this method, voting options are listed in one column, and the voter's choice is entered in an adjacent column.Based on Prêt à Voter, the work in Adidas & Rivest (2006) employs scratch stripes and homomorphic tabulation to permit offline ballot auditing.The following are additional systems that have been proposed for electronic voting:Bingo Voting (Bohli et al., 2007), Helios (Adida, 2008), DRE-i (Haoet al., 2014) and DRE-ip (Shahandashti & Hao, 2016), Star-Vote (Bell et al., 2013), and Sandler et al., 2008, to name just a few, are examples of such voting systems.

PROPOSED SYSTEM DEISGN

The proposed e-casting a ballot framework depends on the deep rooted Prêt à Citizen e-casting a ballot approach recognized in (Ryan,2008).Taking into account specific requirements like privacy, eligibility, convenience, receipt-freeness, and verifiability, the system was designed to support a voting application in the real world. The goal of the proposed system is to make digital voting safe while still making it easy to use. In this context, a web-based interface is used in the design of the system to make it easier for users to participate, and safeguards like finger printing to prevent double voting are included. With an unmistakable need to manage the citizens, supporters and contender for voting demographics, an easy to use head point of interaction is carried out to empower simple entry. In addition, the system preserves voter anonymity while ensuring that all voters have equal participation rights and that all candidates engage in fair and healthy competition. As evidence that the vote was cast, the voter receives an email containing the cryptographic hash of the transaction (ID), which can later be tracked outside the premises.

The Voting Process

Based on our current implementation of the system, we now describe a typical user interaction with the proposed scheme. A voter typically logs into the system by providing a thumbprint. The voter is then given a list of candidates with the option to vote against them if the match is found. On the other hand, any additional access would be denied if the match was unsuccessful. An appropriateimplementation of the authentication method—in this case, fingerprinting—as well as predefined role-based access control management are used to carry out this function.

Additionally, it is anticipated that a voter will be assigned to their particular constituency, and this information will be used to create a list of candidates for which a voter can cast a ballot. Because voter assignment to a constituency is done offline, it is outside the scope of this study.

CONCLUSION AND FUTURE WORK

Since the 1970s, electronic voting has been used in a variety of ways. Compared to paper-based systems, it has fundamental advantages like reduced errors and increased efficiency. A number of initiatives have been launched to investigate the possibility of utilizing blockchain to support an efficient e-voting solution in light of the extraordinary growth in the use of blockchain technologies.One such effort has been presented in this paper, and it uses blockchain's cryptographic foundations and transparency to provide an efficient solution to e-voting. An in-depth evaluation of the proposed method reveals its effectiveness in meeting fundamental requirements for an e-voting scheme after it was implemented with Multichain.

As we move forward with this project, our primary focus is on strengthening the resistance of blockchain technology to the "double spending" issue, also known as "double voting" for electronic voting systems. Despite the fact that blockchain technology detects malleable change in a transaction with significant success, the successful demonstration of such events piques our interest in further research. To achieve an end-to-end verifiable e-voting scheme, we believe an efficient model to establish dependable provenance fore-voting systems will be essential. An additional provenance layer is being developed to support the existing blockchain-based infrastructure in order to accomplish this.

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Students' Perceptions towards the Quality of Online Education: A Qualitative Approach

Abstract

How higher education institutions can guarantee the quality of online learning has become a growing concern over the past few years. While students' perceptions of the quality of online education have received relatively little attention, several studies have examined faculty and administrator perceptions.
This study examined the perceptions of students from two colleges and one junior college regarding the nature of online education in light of their own online growth opportunities using subjective methods. Interviews and observations were conducted with three students. A variety of documents, both digital and printed, were gathered. The positive and negative experiences of the students were examined. Additionally, the factors that influence those experiences were identified. Students had positive experiences with flexibility, cost-effectiveness, access to electronic research, ease of Internet connection, and a well-designed classroom interface, according to the findings of this study. Instructors can make use of the findings to gain a better understanding of students' perceptions of online learning and, in the end, enhance their online instructional methods. The negative encounters of the understudies were brought about by deferred input from teachers, blocked off specialized help from educators, an absence of self-guideline and self-inspiration, a feeling of disengagement, dull informative strategies, and inadequately planned course satisfied.

Introduction

Due to the rapid expansion of the Internet, online education has emerged as a viable alternative to traditional classroom instruction. However, there have been numerous concerns and issues, particularly with regard to the online education's quality. According to Harasim (1989), online education is a new type of education that uses computer-mediated communication to combine in-person instruction with distance learning. According to Ascough (2002), online education has the following characteristics: because students are unique, it offers a learning experience distinct from the traditional classroom;

b) Computers and the World Wide Web facilitate communication;
c) a variety of students participate in class;
d) There is a shift in the learning environment's social dynamic
e) prejudice and discrimination are minimized (p.1).

As an alternative to traditional classroom instruction, higher education institutions are increasingly turning to online courses and degrees. According to a recent survey that was carried out by Allen and Seaman (2003), at least 80% of the course content that was offered by higher education institutions in the United States was delivered online. Regardless of the definition, a survey that was carried out by the United States Department of Education and found that more than 54,000 online education courses were offered in 1998 with more than 1.6 million students enrolled provides an early indication of the widespread popularity of these courses (cited in Lewis, et al.).More than 1.6 million students took at least one online course in the fall of 2002, according to Allen and Seaman (2003) in a more recent study. b) 578,000 of these students took all of their classes online, or more than one third of the total; c) In the

fall of 2002, at least one online course was taken by 11% of all higher education students in the United States; d) A minimum of 13% of students enrolled in online courses at educational establishments (p.)

Purpose of the Study

Despite the growing body of literature on the subject, there are few studies on the quality of online education. Few researchers have examined the quality of online education from the perspective of students. Consequently, it is necessary to investigate how students evaluate online education quality. The purpose of the study was to assess the quality of currently available Internet-based online education courses. This study wanted to find out how students felt about the quality of online education. The study's findings may contribute to the online education literature in terms of quality assurance. It is hoped that the findings will enable online education providers to evaluate their offerings in light of the study's findings and recommendations.

Limitations

There are a few limitations to this study that need to be addressed. First and foremost, the three students who participated in this study were only enrolled in three distinct classes at two universities and a community college. Each instructor in the study had a distinct approach to communicating with students and presenting course material. Consequently, the instructor's characteristics may have influenced students' perceptions of their online education.

Second, the online courses were presented in a variety of formats. As courseware, WebCT was used in two classes and Blackboard was used in one. The interface, class design, and layout were all distinct, despite the fact that the technology used in the courseware shared numerous similarities.

Thirdly, the classes covered many subjects and were instructed at different levels. One of them was a graduate course in Educational Psychology. The first was a class for undergraduates on music appreciation, and the third was a class for undergraduates on social development.

Definition of Terms

The term "online education" as defined by Paulsen (2002) was used in this study.Paulsen says that online education is distinguished from face-to-face education by the following characteristics:

• the separation of teachers and students;

• the influence of an educational organization;

• the use of a computer network to present or distribute some educational content;

• the provision of two-way communication via a computer network so that students can benefit from communication with teachers and staff.p.1.)

Review of Literature

Numerous quantitative research (Bennett & Bennett, 2002;1993, Goodwin; A number of studies (Hara & Kling, 1999) have been carried out in an effort to ascertain the efficiency of online learning. However, very little research has attempted to control for student variables, which may provide answers to questions like: How do students' perceptions of online quality relate to their computer skills? Do students' learning outcomes also depend on their computer skills? How does the online environment's communication affect students' perceptions and learning outcomes? These are just a few of the questions that, according to Thurmond, Wambach, Connors, and Frey (2002), are frequently overlooked or understudied in research that evaluates the quality of online learning.

Quality assurance guidelines and principles

Accreditation bodies for higher education have also paid attention to online education's quality. Numerous organizations published and proposed guidelines or principles to ensure the quality of online education. The Western Cooperative for Educational Telecommunications (WECT) developed the Principles of Good Practice for Electronically Offered Academic Degree and Certificate Programs in the early 1990s (Twigg, 2001). Since then, numerous other organizations have developed practices and principles that are comparable. For instance, the American Distance Education Consortium (ADEC) developed the "ADEC Guiding Principles for Distance Learning." The Alliance and the American Council on Education's joint task force: An Adult Alternative Programs

Association wrote "Guiding Principles for Distance Learning in a Learning Society. "The Instructional Telecommunications Council provided "Quality Enhancing Practices in Distance Education. "Distance Learning:" was created by the American League of Instructors (Rearward). Rules for Appropriate Lead." "The Council of Regional Accrediting Commissions published "Guidelines for the Evaluation of Electronically Offered Degree and Certificate Programs," which updated and clarified WECT's statement (Twigg, 2001).

The Institute for Higher Education Policy (IHEP) proposed 24 standards for assessing the quality of Internet-based learning in a comprehensive review that was carried out in the year 2000.According to IHEP (2000), these standards were broken down into seven categories: institutional support; course improvement; teaching/learning; course structure; understudy support; personnel backing; and assessment and evaluation. Three of the seven categories are related to students. The three are student support, course structure, and teaching and learning. This review uses the hypothetical structure of the IHEP student Benchmark scales to determine whether students' apparent positive experience with online training is compatible with IHEP Benchmarks.

Students' perceived strengths of online learning

Petrides conducted a qualitative study of students' perspectives on web-based learning.

When questioned, some of the participants indicated that, in comparison to verbal responses, writing responses caused them to think more deeply about the subject matter. The study was conducted in a blended university online class, which means that the class was a regular one-semester class supplemented by web-based technology (Learning Space).They explained that the ongoing and public display of the discussion posts on the Internet enabled them to constantly consider one another's ideas. There is something that compels you to contemplate branches of knowledge when you need to answer recorded as a hard copy," a member expressed (Petrides, 2002, p. 72).This was emphasized by another member, who expressed that the web-based innovation considered more reflection than study hall conversations face to face.

In the writing on web based learning, accommodation has additionally been referenced as a benefit. For instance, a study conducted by Poole (2000) on student participation in a discussion-based online course found that students engaged in online discussions at times that were most convenient for them, such as on weekends. Poole additionally found that understudies generally utilized their home PCs to get to the web-based course, which was the most helpful area for them. Similar findings have been made by other researchers, who discovered that online students read and respond to comments made by instructors in online discussions at times that work best for them, such as early in the morning or late at night (Murphy & Collins, 1997).

Students' perceived weakness of online learning

Petrides conducted a qualitative study of students' perspectives on web-based learning.
When questioned, some of the participants indicated that, in comparison to verbal responses, writing responses caused them to think more deeply about the subject matter. The study was conducted in a blended university online class, which means that the class was a regular one-semester class supplemented by web-based technology (Learning Space).They explained that the ongoing and public display of the discussion posts on the Internet enabled them to constantly consider one another's ideas. There is something that compels you to contemplate branches of knowledge when you need to answer recorded as a hard copy," a member expressed (Petrides, 2002, p. 72).This was emphasized by another member, who expressed that the web-based innovation considered more reflection than study hall conversations face to face.
Convenience has also been cited as an advantage in the research that has been conducted on online education. For instance, a study conducted by Poole (2000) on student participation in a discussion-based online course found that students engaged in online discussions at times that were most convenient for them, such as on weekends. Poole additionally found that understudies generally utilized their home PCs to get to the web-based course, which was the most helpful area for them. Similar findings have been made by other researchers, who discovered that online students read and respond to comments made by instructors in online discussions at times that work best for them, such as early in the morning or late at night (Murphy & Collins, 1997).

Factors that influenced students' online learning experiences

Students' experiences with online education will be influenced by a variety of factors. Technical issues, a lack of community, and difficulty comprehending instructional goals were obstacles, according to Song, Singleton, Hill, and Koh's (2004) survey on graduate students' perceptions of useful and challenging aspects of online learning.

Other researchers have also identified learner characteristics (Howland & Moore, 2002) and the design of the learning environment (Clark, 2002).Song and co., 2003; Dwyer,2004).

Learner characteristics that influenced students' experiences

Students' individual characteristics influence their learning styles and online learning experiences.
According to Howland and Moore's (2002) study of students' perceptions of online learning as distance learners in Web-based courses, students with credits consistent with constructivist students had the best perceptions of online learning. Students with a positive attitude were more independent, proactive, and accountable for their education. On the other hand, the students who had a more negative impression of their online learning had the same expectations for information and structure as they did for a classroom setting. Students who had negative perceptions said they needed more structure and feedback from their teachers. According to Howland & Moore (2002), these students referred to abandonment as the instructor's lack of communication and feedback.

Learning Environment that influenced students' experiences

Another important aspect of the online experience is the design of the environment itself. The success of e-learning "all depends on the quality of the designed content," as stated on page 599 of Clark (2002)'s Myths in E-Learning. Additionally, he suggested that e-learning content should be more "meaningful, distinct, vivid, organized, and personal" in order to increase student retention (p. 601).

In the current practices of online education, the text serves as the primary means of communication. Text can be found in multi-media, on the web, and customary paper designs. These texts are found in a different setting than one another. The learning style and learning objectives are included in the context in which the text is experienced. According to Dwyer (2003), textual communication, on the other hand, is more effective when it incorporates feedback, analogies, questions, and visuals. Textual communication, on the other hand, is more effective when it incorporates visuals.

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Methodology

This study's research design was a qualitative one based on documents, interviews, and observations. According to Fraenkel & Wallen (2003; 1999, Glesne), qualitative research provides an understanding of a situation or phenomenon that tells the story. Methods of qualitative research include document analysis, interviews, and observations.
Triangulation, or combining a variety of types of information, can help better analyze or interpret a situation. According to Patton (1990), on page 18, "studies that use only one method are more susceptible to errors related to that method than studies that use multiple methods in which different types of data provide cross-data validity checks." Observations and interviews are only two steps in that process.
The organized and unorganized meetings, perceptions, and documentations were the information assortment strategies used in this study. Reinforcing the data gathered from perceptions and meetings with additional information is not only appealing but also not fundamental (Stake, 1995).

Findings and Discussion

The purpose of this study was to investigate students' perceptions of online education based on their online learning experiences. Students' perceptions of online education have been investigated based on their own experiences. The influences on these students' online education experiences are also examined.

The results of this study will be divided into two categories: students' positive and negative experiences. Some of the students' positive experiences included: The students' negative experiences were identified as: availability of electronic research, affordability, adaptability, and ease of Internet connection lack of self-control and self-motivation, inaccessible technical support from instructors, and delayed feedback from teachers. Students' positive experiences were influenced by the following factors: the convenience of having access to the Internet, the ease of navigating the interface of the online class, the adaptability of class participation time and self-paced study, the cost-effectiveness of the online class, the availability of electronic research, and familiarity with the instructor delayed feedback from instructors a lack of self-control and self-motivation on the part of the instructor, a sense of isolation, monotonous teaching methods, and inadequately designed course material are all contributing factors.

Conclusions and Recommendations

This study aimed to learn more about students' attitudes toward online learning. This study's subjective examination methods were appropriate for achieving this goal. A depth of information that quantitative methodology could not have provided has been provided through the analysis of interviews, observations, and archival data.

While receiving online education, participants experienced both positive and negative outcomes, with a preference for positive outcomes. The cost-effectiveness of the online class, the availability of electronic research, the well-designed course layout, the ease of connection to the Internet, the ease of navigation of the online class interface, and participants' familiarity with the instructor all contributed to positive experiences for them. The negative experiences of students were caused by the following factors: delayed feedback from instructors; a lack of self-control and self-motivation on the part of the instructor, a sense of isolation, monotonous teaching methods, and inadequately designed course material are all contributing factors.

According to this study, the familiarity of the instructor had an impact on the learning experiences of students as well. An online student may feel more at ease taking the instructor's online class if they are familiar with the instructor. Based on this finding, one could keep thinking about whether first-year workforce ought to show a web-based class. Additional research may focus on the effectiveness of online teaching by senior faculty and first-year faculty.

Participants provided moderate responses when asked to rate the overall quality of their online education. They were either dissatisfied with their online education or did not believe it to be of high quality, indicating that it was of moderate quality. The members' feeling of obligation for their own schooling might be impacted to a limited extent by their characters. Some of the behaviors that online students may need to change themselves include not being an active and constructive learner, not having enough self-motivation, and spending too much time on the phone. However, when their negative experiences were investigated, the online instructor was found to be associated with all of the factors, with the exception of the one that was related to characteristics of the learner (lack of self-regulation or self-motivation).

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Basic Application and Study of Artificial Neural Networks

ABSTRACT

Artificial Neural Networks, or ANNs, their various characteristics and business applications are the subject of this paper. In addition, in this paper, we explain "what are neural systems" and "why they are so important in today's Artificial knowledge. "because of numerous advancements in the creation of intelligent frameworks, some of which were influenced by natural neural systems. Options and other applications from ANN have the potential to have a significant impact on the software and computer engineering fields of today. A few restrictions are also mentioned. An information dealing with perspective called a Fake Brain Organization (ANN) is enlivened by how regular tangible frameworks, similar to the psyche, plan information. The most significant aspect of this worldview is the novel structure of the framework for data preparation. It is comprised of numerous highly interconnected handling components (neurons) that collaborate to resolve particular issues. ANNs learn from examples, just like people do. Through an educational experience, an ANN is intended for a particular application, like plan affirmation or data plan. Learning within natural frameworks necessitates conformity to the synaptic connections between the neurons. This is also true for ANNs. An overview of the Artificial Neural Network, its operation, and its preparation are provided in this paper. Additionally, it clarifies the objective and application of ANN.

Keywords: ANN(Artificial Neural Network), Neurons, pattern recognition, Feedback Network, Feed Forward Network,Artificial Neuron, Characteristics and Application.

INTRODUCTION

The primary source of inspiration for the idea of ANN is the scientific study of how the neural system in the human body works. The body uses the neural system to complete tasks. A million-strong web of associated bury neurons constitutes a neural network. Because all parallel handling is carried out with the assistance of these interconnected neurons, the human body is the best example of parallel processing. A neuron is a one-of-a-kind natural cell that processes data by moving it from one neuron to the next through electrical and chemical changes. It is made up of a cell body, or soma, and two kinds of branches that move outward and resemble trees: the axon and dendrites. The plasma in the cell body's core, which houses the atomic hardware or the material for making new neurons, contains information about a person's genetics. The entire process of accepting and transmitting signals is carried out in a particular way, much like a neuron receives signals from another neuron through dendrites. Through a long, thin stand known as an axon, neurons send signals when electrical movement spikes occur. These signals arecarried to other neurons by an axon via neurotransmitters. Neural systems can be used to focus designs and identify patterns that are too confusing for humans or other computer systems to understand due to their remarkable ability to make sense of unreliable or confusing information.

ARTIFICIAL NATURAL WORK

Neural networks take a different approach than conventional computers when it comes to critical thinking. Traditional computers use an algorithmic approach to solve problems, in which the computer follows a set of instructions. If the computer doesn't know exactly what it needs to do to fix the issue, it won't be able to. Because of this, ordinary computers can only think critically about things that we alreadyknow and understand. Computers, on the other hand, would be much more useful if they could carry outtasks that we do not fully comprehend. Neural systems handle data in the same way that the human braindoes. The system is made up of many interconnected preparing components (neurons) working simultaneously to solve a particular problem. Neural systems learn by using examples. They cannot be adapted to a specific task. If the cases are not selected with care, valuable time will be wasted, and worse,the system may not work properly. Due to the fact that it determines how to deal with the issue on its own, the system's operation can be unpredictable. Conventional computers, on the other hand, employ intellectual critical thinking; The way the problem will be explained must be stated clearly and concisely.These headings are then transformed into machine code that the PC can obtain from an unusual state vernacular program shortly after. These machines do not come as a surprise at all; if anything goes badly,it's because of a problem with the item or gear. Neural systems and regular algorithmic computers work together rather than against each other. An algorithmic approach is required for tasks like number jugglingand errands, which are better suited for neural systems. In addition, frameworks that employ a combination of the two approaches—typically a standard computer is used to manage the neural system—are required for a significant number of tasks to be successful.

2.1 What is Artificial Neural Network?

The structure and functions of biological neural networks serve as the foundation for a computational model known as an Artificial Neuron Network (ANN). In a sense, the input and output that a neural network receives influence how it changes or learns. Consequently, the ANN's structure is influenced by the information that moves through the network. Artificial neural networks are electronic models with a moderate amount of roughness, reflecting the neural structure of the brain. The mind actually benefits fundamentally. It is abundantly clear that problems that are beyond the capabilities of current computers can be solved by small, powerful bundles. Furthermore, this brain display guarantees a less specialized approach to machine arrangement design. Likewise, this clever way to deal with handling gives a more refined debasement during system over-burden than its more traditional accomplices. The following critical advancement in the enrolling business is believed to be these normally set off handling techniques. Absolutely, even essential animal minds can set limits that PCs can't even come close to. Repetitive tasks like record keeping and complex math are well-suited for computers.

Computers, on the other hand, struggle to comprehend even the most basic examples, much less combine these examples from the past into endless activities. Presently, progressions in natural exploration guarantee a central comprehension of the traditional instinct instrument. This study demonstrates that examples are stored in the brain as data. Because some of these examples are extremely entangled, we are able to see distinct appearances from a variety of perspectives. Another processing field is involved in this process of saving data as examples, using those examples, and then dealing with problems. As was mentioned earlier, this area does not make use of traditional programming; rather, it focuses on the development of massively parallel systems and how they are prepared to deal with particular problems. Furthermore, words like "proceed," "answer," "self-figure out," "learn," "summarize," and "exclude" are utilized in this field in something else entirely than conventional figuring. The term "artificial neural network" (ANN) ought to be used more frequently when discussing a neural system. Computers called ANNs are designed after the brain. Most of the time, they are made up of a lot of fundamental preparing units that are wired in a strange correspondence pattern. Each unit or hub is a simplified version of a real neuron that, in response to sufficient input from other hubs it is associated with, emits additional lights or flags.

A biological neuronal network or circuit used to be referred to as a "neural network" in the past. However, the term "ANN" is utilized frequently nowadays. A mathematical or computational model based on how the nervous system of a living organism, like the brain, works is known as an information processing paradigm (ANN). The basic components of ANN are programmed artificial neurons that resemble m biological neurons. There are connections between these artificial neurons. These neurons collaborate to resolve specific problems. Without creating a model of a real biological system, ANN can be set up to resolve AI-related issues. Adaptive control, image analysis, speech recognition, and other applications require ANN. These applications are carried out through a learning process that involves adjusting synaptic connections between neurons, similar to learning in a biological system. The ANN is identical.

NETWORK DESIGNS

Figure below depicts additional divisions of the Feedback and Feed Forward Network architecture.

4.1Working of Artificial Neural Network:

The other aspects of the art of using neural networks center on the numerous ways that individual neurons can be clustered together. Because of this clustering in the human mind, information can be processed in a dynamic, interactive, and self-organizing manner. Brain networks are organically constructed from minute components in a three-layered world. Interconnections between these neurons appear to be almost effortless. That is not the case with any artificial network that has been proposed or is in use. Integrated circuits are two-dimensional devices with a limited number of interconnecting layers using current technology. This physical fact limits the kinds and applications of artificial neural networks that can be implemented in silicon. Neural networks are currently nothing more than a collection of primitive artificial neurons. This clustering is created by creating layers that are connected to one another. How these layers connect is another aspect of the "art" of engineering networks to solve real-world problems. Every simulated neural system has essentially the same topology or structure. A portion of the neuron's current reality interfaces provide the neuron with its information sources in that configuration. The system's yields to these current realities are provided by various neurons. This yield could be the character or image that the system believes it has checked or is seeing. None of the remaining neurons can be seen to escape. A neural system, on the other hand, is more than just a collection of neurons. Some early analysts tried to randomly associate neurons without much success. Now, we know that even the brains of snails are well-organized machines. One quick and easy way to outline a structure is to layer components in layers. The association of these neurons with one another, their summation and exchange, and the assembly of these neurons into layers make up a functioning neural system. These qualities are referred to in the same general terms across all systems.

The majority of applications necessitate systems with all three common layers—input, covered up, and yield—despite the fact that there are useful systems with only one layer or even one component. Depending on the application, the layers of information neurons either receive information directly from electronic sensors or from information records. The yield layer specifically transmits data to the outside world, an additional computer handle, or additional devices, such as a mechanical control framework. Between these two layers, there may be numerous hidden layers. In these inner layers, numerous neurons are housed in a variety of interconnected structures. Each of these cloaked neurons only communicates with other neurons via information and output. In many systems, every neuron in a hidden layer receives signals from the majority of the neurons in a layer above it, typically an information layer. The yield advances when a neuron reaches its capacity and sends its output to the majority of the neurons in the layer below it. (Note: In segment 5, the drawings are flipped over, data sources enter the base, and yields emerge at the top.)

ARTIFICIAL NEURAL NETWORKING

Which system is ready to be prepared after it has been organized for a specific application? The underlying weights are selected haphazardly to begin this procedure. The learning, or preparation, begins at that point. There are directed and unsupervised approaches to preparing. An instrument for either physically "evaluating" the system's execution or providing the desired yields with the sources of information is included in administered preparation. In unsupervised preparation, the system must comprehend the contributions without assistance from outside sources. The immense weight of systems that make use of directed preparation. Solo getting ready is used to play out some fundamental depiction on wellsprings of data. Despite the fact that it has the all-encompassing impression of being truly self-learning, it is still merely a sparkling guarantee that is not fully understood, does not work, and is consequently sent to the laboratory.

Supervised Training:

The yields and wellsprings of data are both provided in coordinated planning. The information sources are then processed by the system, which then compares its subsequent yields to the desired yields. The framework then changed the weights that control the system as a result of errors spreading throughout the system. This procedure is repeated each time the weights are changed. The information that makes preparation possible is the "preparation set. "During system preparation, a similar arrangement of information is frequently handled as the association weights are continually refined. The current business arranges improvement bundles provide devices for determining how well a counterfeit neural system is uniting on its ability to anticipate the correct response. These tools let the preparation process go on for a long time, stopping only when the framework reaches a point or level of exactness that is required by law. However, some systems never develop. This could be because the information data do not contain the particular data from which the desired yield is calculated.

Arrangements also fail if there is not enough information to allow for complete learning. In a perfect world, there ought to be sufficient data for a test to be administered on some of it. For data maintenance, many layered frameworks with various centers are appropriate. The collection of a set of data that can be used to test the system after it has finished its preparedness is required for directed preparation. This is done to see if the system is simply remembering its data in a non-critical manner. If a system is unable to solve the problem, the planner must examine the information and yields, the number of layers, the number of components per layer, the associations between the layers, the capacity for summation, exchange, and preparation, and even the underlying weights themselves. The "workmanship" of managing neural systems takes place during the steps that need to be taken to make a system work well. The planner's inventiveness extends to overseeing the preparation's guiding principles.

For the flexible input required to alter the weights, a variety of laws (calculations) are used during preparation. The most well-known strategy is reverse mistake proliferation, also known as back-spread. These various learning strategies are examined in greater detail later on in this report. However, there is more to preparation than just a procedure. A "vibe" and conscious investigation are included in the system to avoid overpreparation. The general measurable patterns of the information serve as the basis for the initial design of a simulated neural system. After that, it continues to investigate various aspects of the data that, taken as a whole, may be incorrect. Once the framework has been effectively prepared and no additional learning is required, the weights can be "solidified" if desired. This completed system is then transformed into equipment in some frameworks to expedite the process. The various frameworks continue to learn as they are utilized rather than protecting themselves.

Unsupervised, or Adaptive Training:

The other kind of preparation is unsupervised preparation. The system has access to data sources in unsupervised preparation, but not the desired outcomes. The framework itself ought to then select the highlights that it will use to collect the data. Self-association and adaptation are common names for this. Unsupervised learning is unknown at this time. This adaptation to nature provides the assurance that futuristic robots would always be able to learn on their own as they encounter new conditions and circumstances. In many life circumstances, proper preparation sets are lacking. In some of thesescenarios, there will be military action, which may involve the use of novel combat strategies and weapons. Due to this startling perspective on life and the human desire to be prepared, there is ongoing research into and pursuit of this field. However, at this time, the vast majority of work on neural systemsis done using frameworks with directed learning. Directed learning is producing the desired outcomes.

CONCLUSION

The other type of preparation is preparing without supervision. We had assumed, by concentrating a fake neural network, that parallel handling would directly result in an increase in demand for artificial intelligence as technology advances. Parallel processing is more important than ever because everyone can save more time and money in any PC and robot-related business by using parallel handling. In this paper, we examined the operation of an artificial neural system (ANN). Preparing the periods of an ANN as well. ANN has distinct advantages over conventional methods in a number of ways. Depending on the application's design and the quality of the internal data designs, a system will typically prepare well. This is true in situations where the connections may not be direct or very fluid. The strict suspicions of typicality, linearity, variable freedom, and so on frequently limit customary procedures. A scientific alternative to these limitations is provided by ANNs. Because an ANN can identify a variety of connections, the client is able to quickly and moderately effectively demonstrate marvels that typically would have been extremely difficult or impossible to explain otherwise. Today, discussions about neural systems are common. Because nature itself is evidence that this works, their guarantee appears to be excellent. Be that as it may, headways in hardware hold the way in to its future and, in actuality, the whole development. The majority of the most recent developments in the neural system are essentially demonstrating the essential functions.

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The advantages and disadvantages of cloning humans as well as the ethical and social problems involved in it!

Abstract

Despite the fact that cloning has the potential to benefit people and our society in numerous ways, it has become a contentious issue in recent times due to its disregard for human morality. Particularly, it is generally held that cloning humans is unethical and immoral for a variety of reasons; however, the morality of human cloning cannot yet be established due to the fact that it is still a new technology. In addition, there is a wide range of opinion regarding it. Critics contend that cloning poses a risk of altering a person's uniqueness, causing psychological and physical effects on humans, posing a threat to society, creating strange kinship, and introducing instability into cloning technology; However, proponents assert that cloning has the potential to advance biomedical technology, raise medical standards, and safeguard the environment. In addition, it is undeniable that human cloning poses a risk that could have serious repercussions; however, we cannot ignore the significant advantages that human cloning could provide, such as advancements in medical science. Therefore, demonstrating the benefits and drawbacks of cloning is crucial.

1. Introduction

I don't think anyone can afford to ignore the advancements in science today. The cloning of human beings, for instance, is one topic that scientific research has shed light on that no one had ever considered before in recent times.

I want to focus on this topic in this essay, particularly on the benefits and drawbacks, as well as the social and ethical issues. I'll begin by giving a definition of cloning. The beginning of life will be the topic of the essay's next section, followed by a list of arguments for and against human cloning. In addition, the subject matter of my essay will examine science fiction and cloning, concluding with the financial justifications for human cloning. Not only is it important for everyone to consider cloning, but I also find it very interesting and exciting to learn more about it, which is why I decided to write this essay. It is an actualization of a scientific possibility. Perhaps genetic engineering and cloning will one day have an impact on my life or the lives of my children. I hope that by writing this essay, I will learn enough about cloning to be able to decide how I feel about the subject.

2. Cloning

[1] The Greek word for "cloning" means "sprout" or "branche.".

The process of cloning is asexual reproduction. We must first understand the fundamentals of sexual reproduction before we can comprehend the technique. Each gamete, which is the man's sperm cell and the woman's egg cell, has 23 chromosomes, and each human body cell has 46 chromosomes2.Because the egg cell and the sperm cell come together during sexual reproduction to create a new life, the gametes only have half of the chromosomes that a body cell has because every body cell has 46 chromosomes, 23 from the mother and 23 from the

father. The number of chromosomes in the body cells of subsequent generations would continue to increase if gametes also had complete sets.

Similar to cloning, the process of fertilization requires the chromosomes—the genetic material—of only one person or thing because the goal is to create something genetically identical to a model. This must be finished by researchers in the lab (abiogenetic).It operates as follows: One body cell from the model is taken, and the core, which contains the entire hereditary material that is on 46 chromosomes, is taken out. After that, the core of this body cell is inserted into an "empty" egg cell—empty because the egg cell's core, which contains the hereditary material on 23 chromosomes, must also be removed. After sexual fertilization, the fertilized egg cell also contains 46 chromosomes, but these 46 chromosomes come from one person rather than two, the man and the woman. The type of cloning that will be carried out—reproductive cloning or therapeutic cloning—determines the next step that will be taken with this fertilized egg cell.

2.1 Therapeutic cloning
The fertilized egg cell is taken out if therapeutic cloning is used. The valuable embryonic stem cells can be taken from a developing embryo after the cell has split several times, killing the embryo. These embryonic stem cells are so valuable because they are necessary for scientific research and can only be obtained from embryos or the umbilical cord. Therapeutic cloning is used to clone organs and tissue for patients who need them (see benefits and drawbacks of human cloning).

2.2 Reproductive cloning
The fertilized egg cell is implanted into the woman's womb in the case of reproductive cloning, where it can mature fully like a "normal" sexually fertilized egg cell. Therefore, the goal of reproductive cloning is to create a human who is genetically identical to another person.

3. When does life begin?
[3] There are a few different points of view on this issue, but the only one that can be proven biologically is that life begins with the egg cell being fertilized. This argument is supported by the fact that because the genes of the mother and father are fused together during fertilization, the new life's genetic identity is already fully established. The embryo continues to grow steadily from this point on, and its genetic identity stays the same throughout this process. You could compare the genetic identity to a blueprint for the development of the embryo; it only takes nine months for this blueprint to become a reality. The embryo does not become a human until after fertilization.

Some other opinions to the question where life begins are the following:
1) Birth is the beginning of life because the embryo cannot survive on its own before birth. For it to live and grow into its full potential, its mother's body is necessary.

2) When a person has the consciousness to live, life begins. In support of this argument, one must assume that coma patients and mentally ill individuals are also dead because they probably lack consciousness.

3) After the first fourteen days, the first three months, etc., life begins. People's support for this argument can be easily explained. It is difficult for many to define a group of cells—which is all a human is at its inception—as living. One can at least recognize an embryo's shape after some time has passed, like three months. The first argument has at least some logic, but the others are hard to accept from a biological perspective because there is no evidence for them.

Because every human being has unquestionable fundamental rights at birth, it is crucial to define the beginning of life. These rights, which include the right to life and the right to dignity, are granted to every human being regardless of age, race, sex, or other characteristics. With cloning we would hurt these common freedoms, assuming one accepts that life starts with treatment. It is a violation of the right to life when a scientist takes stem cells from an embryo for therapeutic cloning and then kills the embryo. Additionally, the scientist violated the embryo's human dignity by treating it like a rat for his experiments and then "throwing it away."

4. Advantages and disadvantages of human cloning

Even though the title of this section of my essay is "advantages and disadvantages of human cloning," you'll notice that I didn't clearly label each fact as either an advantage or disadvantage. Instead, I wrote down everything I knew about this fact and left it up to the reader to decide whether it was a benefit or a drawback. Everyone has their own perspective on this, in my opinion. I can scarcely offer a single definition and assert that this is correct.

4.1 The reversion of the aging process

Using cloning, we can stop our own aging process. It operates as follows: Every body cell that has been cloned is a new cell. It has the advantage of not being as old as the model 6, despite being an exact copy of an existing cell. A person could resurrect his body by copying or cloning seven of his body cells and transplanting these cells into the body as he gets older. This method might one day let people live to any age they want.

On the one hand, "this would eliminate fear of old age and death"8; however, realizing the dream of living forever brings many new issues. There are already too many elderly people and not enough young people to pay for their pensions, which is a problem. This issue would only get worse. Also, even though elderly people are physically healthy, we do not have any medicine or method for reviving their minds. This artificially extended life might not be worth living for some mental patients.

4.2 The production of organs

There are a lot of people who need organ donors, but there aren't always enough, and there is a high chance that the body will reject the new organ. For the rest of their lives, many patients who have an implanted organ must take a lot of medicine with side effects to ensure that their bodies accept the organ. Their quality of life is impacted by these side effects.

Stem cells from embryos can be obtained, making it possible to grow organs or tissues as well. One could clone one's own organs for anyone. "The chances of rejection are nullified" because the clone and model share the same genes9By cloning burn victims' own skin cells, it is even possible to grow skin for them. Helping a burn victim is a big problem today. Currently, the only option is to use skin from a "less important" part of the body to cover the damaged areas—for example, if a person's face is completely burned, he could use skin from his leg to do so.

4.3 The chance to have children for infertile couples
If an infertile couple wants to have children, cloning could help. Those couples are going through hard times right now. They must "go through physically and emotionally painful procedures"10, which are not only costly and time-consuming, but also "estimated to be less than 10% successful"11.Because "being infertile is not considered a ‘real medical problem’12 in people's attitudes," current treatments for infertility do not appear to be improving anytime soon.

The remedy is known as "in vitro fertilization": A single egg cell must be taken from the woman's ovary and placed in a dish with a man's sperm cell for fertilization. After that, the fertilized egg cell goes into the woman's womb. This method will undoubtedly be successful. Using cloning to have children is a brilliant idea from the perspective of couples, but what about ethical considerations? The fertilized egg cell—which will soon become an embryo—could also be enhanced with additional genes for special traits like musical or athletic talent, which will likely result in the designer baby.

Additionally, the egg cell could be examined for particular hereditary conditions. The egg cell can be implanted into the woman's womb if they do not excite; otherwise, it will be destroyed. Pre-implantation genetic diagnosis is the name of this method.
Perhaps the parents only desire a boy or a girl. After that, scientists use a method known as sexing to separate the sperm cells and select the intended child's sex.
When discussing those methods of selecting embryos, there are a few important considerations to make:

1) It is immoral to choose one child over another. By doing this, industrialized nations are no better than Third World nations, which favour boys and frequently kill girls shortly after birth. The only distinction would be that we would "kill" the egg rather than the born child. We must return to the question, "Where does life begin?" at this point. It would not matter if, in your opinion, it begins with fertilization.

2) Interfering with the natural order is wrong. There are those who hold the opinion that there is a "predetermined goal for the evolution of humankind"14.

3) The medication is abused. In a broad sense, it serves to heal.

4) Couples who want children will feel a lot of pressure from embryo selection. First of all, if they fail to test their embryo for certain hereditary diseases, such as HIV, and their child later develops the disease, people may say that they should have done so earlier. Even if a couple doesn't want to, every couple is required to test their child. Additionally, the condition may restrict health coverage to children who have been embryonally screened for certain diseases by insurance companies or state regulations.

4.4 The improvement of reconstructive and cosmetic surgery
[15] With the assistance of cloning, reconstructive and cosmetic surgery could be improved. Cosmetic surgery can still be risky today because the materials used are foreign to the body. For instance, immune disorders may result from silicone breast implants. The patient's tissues would be precisely replicated through the production of bone, fat, and connective tissue by medical professionals. Anyone could change his appearance without risk.

5. Cloning and science fiction

[19] After you have been informed about the benefits and drawbacks of human cloning as a whole, as well as the realistic possibilities that human cloning brings, I want to demonstrate the cloned humans' unrealistic expectations.

In science fiction films and books, we frequently encounter these unreasonable expectations. We are told horrifying tales about clone armies that want to kill humans or the creation of a second Hitler in these fantasy products. I want to use these two examples to show that these horror stories are not real.

First of all, these clone armies are often referred to as unfeeling robot armies whose creators have programmed them to kill other people, which is not possible. As I mentioned earlier in this essay, clones are similar to humans except for the fact that they were created through asexual reproduction and thus share human emotions. The subsequent inquiry is: If a person would have to wait at least fifteen to twenty years before he could use this army for his interests, why would he build such a large army of clones? Clones cannot develop and grow at the same rate as humans.

6. Economic reasons for cloning

[20] You can probably expect that some people will try to make money from cloning. I discovered some options that people could use. I want to make it clear that the first two of those are not very realistic because they violate human rights and are difficult to implement.

6.1 Information retention

An expert worker's DNA could be purchased by a cloning company, and the clone could be made in another part of the world. When the clone has reached adulthood, the cloning company informs him that he is a clone of a high-performing worker, but not who his model is. Naturally, the clone wants to know who the model is and will probably pay a lot of money to get it.

6.2 Extract rents from clones via education

Higher education yields higher returns for those with high abilities, and those who attend elite schools pay high rents. If a group of elite schools joined forces and invested in the cloning of elite individuals, they would produce their own future students and collect a significant amount of rent from them in the future.

6.3 Patents for certain techniques

For instance, if a large company came up with a method for producing organs for transplantation and got it patented, it could make a lot of money because everyone who wanted to use the method would charge this company, which would be people who needed an organ.

7. Conclusion

I want to start by pointing out that the thing I learnt best while writing this essay is that this topic is very extensive. You can’t really discuss every detail in a little essay like this one. I hope I managed to give an objective overall view. In my opinion you can’t think either just negative or just positive about cloning. Many things that cloning makes possible have their advantages as well as disadvantages to them. Lets take for example the reversion of the aging process: Many people would like to “live forever”. On the other hand, this will evoque the pension problem (see “advantages and disadvantages of human cloning”).

To my mind the scientific progress today goes really fast and that's a big problem. We have the possibility to do these big things that nobody has ever done before like cloning but we also have the responsibility for what we do. The question humankind asks today is not "Do we have the possibilty to do it?" but "Do we have the right to do it? Are we ready to stand up for the consequences of our deeds?" Technically it is already possible for a long time to clone humans. Many scientists are eager to try all of the techniques out that they know about but the problem is that the government doesn't allow them to do it yet. Especially the german government is very strict.

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The impact of the digital era on marketing in the music business industry

Abstract

The thesis purpose was to explore the impact of digital era on marketing in music business. The music industry went to a lot of transformational processes due to digitalization. The digital era provided a lot of opportunities for the music business aswell as new challenges. In theoretical part, the main history events of music industry transformation were studied. The impact of Napster, iTunes, Streaming services and Social Media on industry was explained. Based on historical events and marketing concepts such asmarketing mix, social media marketing and customer relationship marketing, marketing strategy in music business were described.
For empirical part, the questionnaire was created. It included question related to thetopics of music consumption and music marketing. The answers were supposed to illustrate customer response regarding mentioned topics.
As the result, the findings demonstrate that the digital era has a huge impact on marketing in music business. The digitalization process influences all four variables ofmarketing mix and has transformed marketing approach. The questionnaire results prove that adaptation to digital reality is vital for successful marketing campaign.

Keywords
Music business, digital era, record labels, music marketing, marketing mix musicbusiness

Introduction

Music is an essential part of many people's everyday life and can be identified as part of the entertainment industry which has a strong connection with the leisure activities. Over the time entertainment industry has been transformed owning to many history events. Therise of digital era put entertainment industry through another metamorphosis. The changesthat were brought by digitalization process also impacted music as a business industry.
The digital era has provided plenty of new opportunities as well as obstacles for the music industry members. Overall, the digitalization has impacted the business structure of the whole industry from the production to consumption processes. In order not to stay behind the progress, the industry experts has had to adapt to the new reality and reconstruct existing business operations. (Hull 2011, 39.)
According to IFPI (2021), in 2020 music market grew by 7.4% even though the world had to face such obstacles as pandemic and, as a result, cancellation of concert tours, which isone of the revenue streams in the industry. Owing to new digital technologies including music streaming services, the market demonstrates the sixth consecutive year of growth. (IFPI 2021,

5.) Moreover, the digital world develops every day: new trends in social media,new social networks, improving in streaming service sector and otherpossible new feautures. Therefore, there is a potential growth for the industry, which should be taken intoaccount by industry professionals for the business strategy development. By researching the industry changes due to the digital era and studying the current model, the developmentperspective of the music business in the near future can be considered from the business perspective.

Objectives

The objective of the study is to research and analyze the impact of the digital era on marketing in the music business. The study will focus on the marketing experience of leading music companies that operate worldwide.

The study objective is divided into 4 steps, which are:

- Establishing a theoretical framework
- Research the key concept that impacted the industry
- Analyze the current marketing approach
- Make analyzes of the possible future perspective based on the research

As the result, this research will explain the main transformations that have happened in the industry and how they have affecedt the development of the industry, present the current situation, and illustrate future opportunities for marketing in the music business.

Delimitations

This thesis work has a set of boundaries that are established by the author.

The music business industry can be researched from many perspectives. The industry includes many types of businesses. In this research, the focus is on the music recording business and companies such as record labels. The record label is music business that is responsible for artist management, marketing and product distribution. Moreover, the record labels, that is explored in the research, should belong to the big three leading music companies: UMG (Universal Music Group), Sony Music Entertainment, and Warner music Group.

Regarding time boundaries, the study will report about the music business from 2000 to the present day. Early 2000 is the beginning of the digital era for the music business. Even though CD existed before 2000 and it is a form of digital recording music, it is not a digital file share technology that has had a major impact on industry transformation and is the main focus of this research.

The study will analyze the main digital technologies that have reshaped the industry. The concepts include Napster (file sharing service), iTunes (online distribution), Spotify and Apple Music (streaming services), Social Media.

Music industry

Brief overview of music industry and recording music business

The music industry can be defined as an industry that earns money by producing music. That term includes various numbers of business activities that can be divided in separatedtype of businesses existed in the industry. Producers, songwriters, record labels, recordingartist, booking management, and other parties are all members of the music industry. (Pastukhov 2019.) It appears that the music business is seen as a business, where only recording artist earns money, but of course, it's not true. Behind the success of a world- famous artist, there is the whole team of industry's professionals and support from leading music companies. The same as in any other type of industry, the precise establishment of business strategy is the core fact in building long-term successful career. Even though, it might seems that being talented is enough for launching career in the music business, unfortunately it cannot secure and guarantee the longevity of the career in the high- competitive industry.
The main focus of the thesis is on the recording business and companies such record labels.The record label is a brand created by music companies to produce, distribute and promotethe artist music. Usually, the label has a control over management processes. The label asa company consists of several departments that are divided into two big division category such as creation, production and distribution, promotion. The first division specifies on music production and involves in processes of finding new artists, choosing repertoire, recording and song writing, and similar music creation activities. The second division is responsible for marketing activities. The aim is to distribute the right music to the right customer at the right time. It should be mentioned that record label also has departments like financial and international departments. (Strasser 2009, 84-85.)

Streaming services

Despite the fact that iTunes partly won the war with the piracy, the music industry did not recover from the Napster case. According to the RIAA the industry revenue in 2015 was not close to the performance ratios of 1999. Fortunately, streaming changed the situation to the positive direction.
In 2006 Swedish entrepreneurs developed streaming service called Spotify, one of the most popular streaming services in present days. The service launched for the USA market in 2011. (Robinson 2021.) Streaming services started to challenge iTunes in terms of music ownership. iTunes offered its users to buy album/song and own it, which was quite similar approach as buying CD/vinyl, but in a digital environment. On the other side, streaming service used the model of access and experience of the whole music library instead of owning a few pieces. (Morris 2015, 165). By the 2015 Spotify had 60 million users, and around the same year Apple introduced its own streaming service Apple Music. The company hoped the compete with the Spotify, so Apple prepared some exclusive content deal with the big artists like Taylor Swift. (BBC 2018.) Around the same time Jay-Z and hisstreaming service Tidal tried to compete with both Spotify and Apple Music. Since Jay-z isinfluential member of the industry, he secured the service support from another huge starssuch as Rihanna, Kanye West and Beyoncé. All three of them released their brand-new albums ("Anti", "The Life of Pablo", and "Lemonade") first on Tidal and consequently madetheir fans signed up for the service. It was a smart short-term business decision that boostTidal activity yet did not provide a long-term effect for the service. (McAlone 2016.)

Social network

Social media is a crucial instrument for today's music industry. At first sight it seems like social network are utilized only for marketing activities but it's not a completely true. Of course, digital marketing has significantly changed business operation of a record labels, it will be discussed in the next chapter. The worth of social media for the industry is a music license. The networks pay quite good money to integrate music into platform feature. (Ingham 2020.) In 2020 Sony Music entertainment sighed a deal of a long-term music license with TikTok for music promotion and discovery. It means that social platform has access to the Sony music catalogue. (Millman 2020.)
YouTube was and still is one of the crucial social media platform for the industry. YouTubeis video sharing platform. The service value is a possibility to share music videos, performance video, and other video content. Instead of making a deal with television network to play music video, artist and label can upload video buy itself and gain even moreviews than on television. Instagram, Facebook and Twitter allow to share lifestyle content with fans, make public announcements, promotion and control narrative on medias. The main purpose of all social network for the industry is promotion and managing relationship with fans and general public.

Customer Relationship Marketing

Customer Relationship Marketing is marketing term that can have many definition. Many people know about CRM only as an analytical software that collect customers data. However, in this section CRM will be explored as a marketing tool which tend to improve customer experience, customer management and loyalty. (Roberts-Phelps 2001, 2-3.)
In present digital reality communication with the customer has a direct type. The old passive communication method such as posters, banners, television advertisement is still suitable option to connect with the broad number of audience and increase company's awareness. With the help of new technologies company establish a two-way communication with the customer and improve long-term relationship. (Roberts-Phelps 2001, 140.)
Customer Relationship Marketing is focusing on customer experience and direct marketing activities towards improvement of customer interaction with the brand. The purpose is expansion of engagement and trust rate with the customers. When company has a strong relationship with the customer it saves money on attraction of a new customers and spendson maintaining existing relationship and improving customer profitability. (Cross 2018.)

Social Media Marketing

Social media marketing (SMM) is a term is used to describe marketing campaigns via social media platform. The concept gained its popularity with high-rate social network activity. SMM and CRM is connected because both concepts are customer engagement oriented and social media play a vital role in the marketing strategy. Marketing campaigns in social media age spinning around publications and audience response to it. Depending on socialnetwork type, marketing managers decided publication type, message, and what outcome is desired. Moreover, with the social media tools customer segmentation process perform in a more effective way regarding target the right audience. Also, social media marketing can be evaluated through different metrics such as CPC (cost per click), views, engagementrate. (Hayes 2021.)
In spite of the fact that social media marketing is powerful modern marketing tool, it has its own disadvantages. One of the most crucial is audience response. If the response is positive, it appears as no issue to the company. But the negative reaction has a possibilityto destroy the company reputation and public image since information shared quite rapidly and people has

tendency to discuss negative things more often. Consequently, business has to face major backlash and launch strategy for PR recovery process. (Hayes 2021.)

Marketing mix in music recording business

Product

In music business the product is recorded albums and singles that are marketed to the audience. During the product creation process, usually A&R and production departments are involved. Producers, songwriters, recording artist, musicians, sound engineers work together to complete music project. The aim of the marketing department to distribute and promote the project to the audience and make it profitable for the record label though the sales itself and other type of revenue streams such as copyright licensing and live performances. (Hull 2011, 230.)

During the history of music industry, music as a product evolved. It went from physical medium to the digital file. This transformation also affected other variables of marketing mix.In terms of "product" variable music became more customized. In the past people bought full album on CD, but now with the streaming services and online distribution platform, people have ability to pick and choose what exactly they want to listen.

Price

Since music projects are now available in different forms, the price range also became more various. In terms of vinyl and CDs the average prices right now are from $20 – 40 for vinyl and from $10-15 for CDs for the album long project. The online version of the same productis drastically lower in pricing. The comparison table of prices for the Billie Eilish latest album "Happier than ever" in physical and online stores below.

Place

With the online reality music accessibility and availability achieved new high point. With the technology's development music can be accessed via smartphone. It made it easier for labels to distribute music to the customers. Moreover, independent labels and artists now have an ability to upload their music online, so basically there is no need in a big label for online distribution. However, without label support it is unlikely that project will receive promotion from the streaming service and will get into the biggest playlists from the start. Also, distribution of physical albums to the retail stores, especially that belong to big corporations such as Walmart and Target, is almost impossible without a proper network which big recording labels have.

During Napster and illegal downloads era dominance, distribution process was a sensitive topic. The illegal file-sharing disturb usual structure of music distribution. In present days, the situation with illegal music sharing is quite stable owing to the streaming services. Commonly, label releases album on all streaming platform at the same time. It significantly boosts album performance from the start. But in some cases, label has a special agreementwith a certain streaming service, and because of it launch album on a platform in advance or provide additional content. In addition, streaming service promote the project through itsown platform by placing songs in the biggest playlists and in a recommendations for the users. Besides this, the artists picture on the cover of the playlists that also attract attention to the artist.

Before release of an album itself there is concept of lead single. It is song that has more promotion than other album song, and its main purpose to make potential audience interested in the album. The lead single has its own promotion campaign that includes steps such as social media announcement, music video, performance, and radio airplay. Besideslead single before album release that usually released a few month before album release there are other singles that been promoted after the release date. Even though presently isstreaming era, radio airplay is still one of the effective promotional tool for the purpose of reaching broad and more old audience. The release of music video for the single is also effective since provide visual content for the project and increase interest to it.
Promotion timeline of one of the most successful album of 2020 “After Hours” by The Weeknd is an excellent example of promotion strategy. Before album release, the artists released two lead single in 2019, “Heartless” and “Blinding lights”. Both songs have music video, have reached #1 spot in Billboard Hot 100 chart, and were performed on a television shows. With the successful performance of singles, the album has become highly anticipated project for artist’s fans and general public. Moreover, besides two singles, artistpreview two other songs from upcoming album, but they were not marketed as a singles. After album was released, there was a third single “In your eyes”. The song has a music video and was performed on a television. Also two remixes were created with the participation of Kenny G and Doja Cat, it gave song a fresh sound. The last album single is “save your tears” a massive hit that also has music video, television performance and remix with the huge pop start Ariana Grande. Furthermore, the artist participate in prestigious music award shows such as MTV VMA and American Music Award. Moreover,The Weeknd was performing at Super Bowl halftime show, which is one of the biggest “scene” for any artist. The “After Hours” promotion strategy also included collaborations with the TikTok, Spotify and Vevo. With the TikTok,

Conclusion

The thesis purpose was investigating the impact of digital era on marketing in music business. By analyzing the historical events that played major role in transformation process, it was clear to see how music business was reshaped. The idea of music ownership, that was represented by music in form of physical medium, changed to the ideaof music experiencing with the digital file sharing technologies and streaming services withalmost unlimited access to the music collections. Since music as a product significantly transformed, the way product marketed to the target audience transformed as well. Recordlabels had to adapt to the new digital reality where music is sold, consumed, promoted andeven performed. Promotion campaigns from billboards and television relocated to the socialnetworks and streaming services where marketing strategy has to be developed differently.The digital era almost destroyed the industry with the illegal and uncontrolled file sharing of music industry products, but later on brought music business into new internet era. Internetmarketing is a profitable modern marketing approach which was successfully adopted by the record labels and expanded list of traditional marketing tools.

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The social implications of humancentric chip implants: a scenario – 'Thy chipdomcome, they will be done'

Abstract

Implants with radio frequency identification (RFID) chips for humans are no longer a fantasy. Even though adoption rates have been very low, preliminary findings have already shown that the number of people who are willing to get chipped has increased since the technology became commercially available in 2002.Three case studies of the main users and innovators of humancentric chip implants are presented in this investigation. The first case involves a British academic researcher who has carried out numerous implant experiments; The second case involves a hobbyist and entrepreneur who has focused on personal space applications using RFID implants; what's more, the third is a family who selected to get RFID inserts from a business association. A real-world scenario is used to compile and present the cases' outcomes. The scenario's purpose is to demonstrate the potential societal repercussions of widespread technology adoption. In addition to the privacy and security topics that are frequently discussed in chip implant studies, this scenario also addresses issues of equity and ethics. For instance, will the technology behind chip implants lead to social segregation? Furthermore, the ethical issue of who chooses to be chipped. It was discovered that the experiences each implantee hopes to have after implantation are strongly correlated with their motivation to receive a chip implant. The situation makes the reader wonder if widespread use of chip implants will be harmful to society or just another technological and cultural shift.

Keywords
chip implants, RFID applications, humans, scenario, social implications, ethics

Introduction

In the past, this technology would have been associated with futuristic technological advancements as depicted in Star Trek—human-centric chip implants, technology under the skin, microscopic digital angels, etc. but no longer. Radio-recurrence ID (RFID) chips are at present being infused into human bodies overall for individual sporting use, research, business necessities and clinical applications. The technology is still in its early adoption phase, despite the fact that human chip implants have not yet been widely adopted. However, there is evidence to suggest that chip implants will emerge as the next major technology and will continue to gain popularity as chip applications expand. The possibility of businesses mandating chip implants for employees has been examined by Kenneth R. Foster, former president of the IEEE Society on Social Implications of Technology: Does that sound crazy?

Yes, now. Maybe not a decade from now. According to previous research, the use of chip implants in humans has numerous social repercussions. Nevertheless, preliminary findings suggest that society is increasingly willing to implant RFID chips into their bodies [2].This may be due to the fact that adopters of a new technology may frequently become distracted by its potential

benefits rather than recognizing and evaluating its potential negative effects [3].As "an informed and sufficiently aroused public can make a difference in the control of the implications a technology can impose," adopters must consider the societal repercussions [4].The purpose of this study is to investigate the social effects of implanting RFID chips in humans. By conducting case studies on the main RFID chip implant users and innovators, the research goal will be accomplished. After that, these findings will be used to create a plausible future scenario in which RFID chip implants are widely used in everyday life.

Literature Review

The RFID chip is the humancentric chip implant that is currently being used the most. An RFID chip is a tiny glass capsule that contains an antenna coil and a microchip. It is 11 millimeters long and 1 millimeters wide [1].The chip doesn't need an inner power source. The chip's built-in antenna draws power from an RFID reader's magnetic field to enable the chip to transmit data [5].Usually, a hypodermic syringe or a skin incision is used to inject the chip into a human forearm or hand. A plastic cap on the chip may, depending on the manufacturer, bind the chip to human tissue and prevent the implant from moving around the body [1].
Perakslis and Wolk have investigated the social context of the development of human chip implant technology [2].According to their research, "globalization and the converging interests of the information age" were impacted by September 11, 2001. They predict that this will lead to a growing acceptance of human chip implants as a security method. The study provides statistical evidence for the growing acceptance of RFID implants by society and their motivations. According to Michael and Michael, "so long as individuals are gaining they generally will voluntarily part with a little more information" [3] when analyzing the behavior of current users of automatic identification technology. The benefits that the user receives are prioritized over the risks that are associated with the technology when participants adopt it as a part of their lives. They come to the conclusion that considering the social repercussions of technology is crucial because they may be detrimental not only to individuals but also to society as a whole. Masters and Michael demonstrate, in their investigation of the current humancentric applications of RFID technology [6], that the current humancentric applications are focused on control, care, and convenience. Masters and Michael discuss the ethical and social implications of the current uses of human-centered RFID technology. Human-centric RFID is primarily concerned with privacy, security, and ethics. Perusco and Michael conducted research on the social effects of human chip implants in location-based services (LBS). Perusco and Michael use scenarios to predict what might happen if implantable LBS technology becomes widely used [7].

The Next “Big” Technology

Human-centric nanotechnology applications and the future of human chip implants are receiving a growing amount of attention. Black [8] expressed skepticism regarding the growing acceptance of microchip implants even prior to 2004, when the U.S. Food and Drug Administration (FDA) granted Applied Digital Solutions permission to inject medical patients with a microchip, stating:] Underskin microchips with GPS or medical data capabilities may soon become commercially available. Are we to be afraid? Three employees of the American company Citywatcher.com were given a microchip for use in access control applications in December 2005.This milestone is discussed by Foster and Jaeger [1], O'Connor [9], and VeriChip [10], all of whom predict that employees—and society as a whole—will soon be implanted for workplace applications. In deliberating, McMurchie [11] is also clear on this point: It doesn't seem like a big leap to say, "OK, you have a wearable, why not just embed the device?" as we look at wearable computers. In addition, it is impossible to rule out the possibility that employees will one day be required to wear embedded chips for maximum security and access control.

Marburger and co.12] conducted a market analysis report on VeriChip, estimating that "VeriChip will sell 1 million to 1.4 million chips in 15 years" using projected growth potential models. Given that Lockton and Rosenberg [13] estimated that only about 7000 VeriChip RFID implants had been sold in 2004, the anticipated adoption rate is exponential. Additionally, it should be noted that the FDA had only approved the VeriChip for use in medicine at the time of the Marburger [12] market analysis.The models of the estimated growth potential would have been even larger if this had not been the case.The main target market for chip implants, according to Marburger's report, is outside the United States [12], though the United States is typically regarded as a late adopter of high-tech devices. Swartz [14] and Masters [6] have documented VeriChip's presence in Europe and South America, demonstrating VeriChip's progress toward making the human chip implant a global phenomenon rather than a North American one.

Significance of Research

"The number of do-it-yourself RFID [implantees] has grown to include hundreds of people worldwide," according to Graafstra [15].The publication of Graafstra's RFID Toys [16] and his most recent article, "Hands On: Both "How Radio-Frequency Identification and I Got Personal" explain how "RFIDs," also known as implantees, can use chips to implant themselves.In the past five years, attitudes toward implanting chips into the human body have changed. In a 2002 survey, Perakslis and Wolk [2] found that 78.3% of respondents were hesitant to have a microchip inserted into their bodies, primarily because they thought it would be "creepy. "Nonetheless, after 3 years another review shows that those reluctant to get a chip embed into their body was diminished to not exactly half (48%) and 33% (33%) of respondents were willing [17].

According to Naisbitt and Philips [18],Technology is hard to get rid of once it is ingrained in society, like public policy. Foster and Jaeger [1] speculate that mandatory RFID implants as a job requirement is not a far-fetched idea and could become a reality in the next decade, even though human chip implants are currently not considered to be "embedded into society. "This paper is important because it gives people a chance to think about the social implications of microchip implants for humans before they are widely used.Because it examines the motivations, experiences, and journeys of current implantees and innovators, it is significant work. Mr. Amal Graafstra referred to one of the case studies as follows: I adore technology, so my concern is not the technology itself. It's fantastic, and I hope it's developed and put to good use. The people are my main concern. If no one presses the button, a bomb is no worse than a flower.

Methodology

A multi-phase approach was utilized in this qualitative investigation. During the initial phase, case studies were carried out. A case study is used to "contribute to our knowledge of individual, group, organizational, and social... phenomena," as stated by Yin [19].The case study protocol addressed the following key questions: i) what prompted each implantee to get them, ii) how the implantees felt after they were implanted, and iii) where they thought the technology was going in the end. This paper presents three case studies. Professor Kevin Warwick is the subject of the first case study, which is titled "Researcher" and focuses on how he inserted himself in the name of research [20].Mr. Amal Graafstra is the subject of the second case study, which is titled "Hobbyist" and focuses on his acquisition of a humancentric implant for recreational purposes [15].The Jacobs Family is the subject of the third case study, which is titled "Corporation" and focuses on their use of the commercial VeriChip RFID implantable device.

Data Collection

The three primary sources of data for the case studies were as follows:i) primary interviews with Professor Kevin Warwick and Mr. Amal Graafstra, which were carried out in 2007, ii) primary sources, which included the websites of the individual case studies, including the VeriChip corporation, and iii) secondary resources, primarily newspaper articles, online news reports, and

journal articles, which were found between the years 2003 and 2007.The RFID community is familiar with the case studies because the subjects are frequently regarded as pioneers or forward-thinking innovators in their respective fields. This paper is quick to introduce a troupe of proof found in the extraordinary number of meetings directed by the implantees with innovation magazine columnists.

Data Analysis

Through subjective record investigation on the significant information gathered, the contextual analyses can be deciphered into account structure. Following the case study procedure, the data will be analyzed to learn about the implantees' reasons for getting implanted, their experiences as implantees, and their perceptions of the technology and its trajectories. Major themes for inclusion in the scenario were identified from hundreds of articles, secondary interviews, and web pages that have discussed the social implications of chip implants.

Scenario-Narrative

A scenario from a short story will be used in the second phase of analysis. The real-world case studies provide the reader with an opportunity to observe significant themes in a particular setting and background. A scenario is "an internally consistent view of what the future might turn out to be," according to Lindgren and Bandhold [21].This definition suggests that the scenario will have a consistent view of the social repercussions that would occur in the future if human chip implants are widely used in the current research. The presentation, which is a future prediction based on current evidence provided by the subjects themselves, is what makes this method effective. The advantage of having both users and innovators as characters in the scenario is that it allows for a cross-case comparison of the various drivers and motivations for the implantation of human chips as well as the various potential social implications that may arise from each case. The complete research design and two-phased case study and scenario methodological approach are depicted in Diagram 1.

The scenario is based on case studies, which allows for some literary truth and sheds light on the morals associated with human chip implants. “a correspondence between how characters behave in a story and how they would behave in similar circumstances in real life” is how Artz [22] defines literary truth. Artz says that imagining scenarios "let us see the world, not as it is, but as it could be. "We are also able to make decisions about how the world ought to be because we can see it as it could be. In a similar vein, according to Grodzinsky [23], "moral imagination helps us envision the type of technology and society that we would like to live in. "As a result, the current research is able to create a scenario that demonstrates the current social consciousness by analyzing the case studies and employing moral imagination. The scenario will help the reader decide whether the use of chip implants is beneficial or detrimental to society.

Conclusion

There is indication to suggest that social attitudes are shifting, and the idea of implanting a chip into a person's body is becoming more commonplace. Nevertheless, in order for society to gain insight into what it's like to be microchipped, there is a dearth of research that delves into the lives of current implantees. Today, there isn't yet sufficient data for individuals who are thinking about getting an embed to conclude whether the innovation is positive or possibly adverse to them and for society. The study's most important finding is that the social ramifications of using a chip can be influenced by a person's motivation for doing so. This is first demonstrated in the identification and differentiation of the case studies—human subjects—based on their reasons for obtaining implants (researcher, hobbyist, corporation-customer).The divergent experiences of each case demonstrated the diverse reasons for implanting and, by extension, the diverse effects that the chip had on their lives. It is essential to point out that the hobbyist had kept his microchip implant for a number of years (up to this point), whereas the researcher had only kept it for a few brief

experiments. Finally, the VeriChip case presented a device that could theoretically be implanted for life.
The primary societal repercussions of each case were revealed by the qualitative content analysis of the case study sources.

Technology (researcher's perspective), security (hobbyist's perspective), and privacy (corporation-customer's perspective) are the three primary themes derived from the data collection. Despite the fact that hobbyists generally dislike "enforced" or "mandatory" technology applications of any kind (including biometrics and even for seemingly convenience-based applications), research into the cases reveals that the current innovators and users of chip implant technology believe that there is little or no correlation between national ID systems and implants. Studying Professor Warwick's case revealed a significant social implication: the possibility that chip implant technology will result in social division. In the future, only those who can afford it may be able to have chip implants inserted. As a result, there may be a gap between social classes: the wealthy and the poor. The scenario best exemplifies this: Zach being the poor person and Dr Wojtysiak being the have. The query, "Who selects chipped individuals?" was also looked at in the scenario in the mother who insisted that her thirteen-year-old son receive a Lifechip for medical reasons and to improve his chances of finding a job in the future.

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The Practice of Virtual Reality in Education

Abstract

The author's recent multimedia research in Australia, the US then Latin America has reaffirmed the significance and effectiveness of visual elements in educational materials. It has been demonstrated that multimedia can provide a very effective teaching and learning environment that takes into account the learners' preferred learning styles—visual, aural, text, and kinesthetic.

The findings indicate that the visual aspects and interaction with the multimedia system are the features that students prefer most. Students who were surveyed in all of these studies have also indicated that the visual elements are very important for understanding the concepts.

On the basis of these findings, additional research was carried out to investigate the possibilities of developing visual learning environments that are even more rich. The purpose was to investigate the effectiveness of computer-generated educational software systems for learning.

Nursing and business students, respectively, attended a virtual reality multimedia tutorial on fundamental human anatomy topics. After the tutorial was over, each student was interviewed and asked to share their thoughts and ideas. It was concluded that by providing images and visual features that are significantly more realistic, virtual reality multimedia could enhance learning. In terms of ease of learning and close resemblance to the real world, both groups of students found the virtual reality multimedia teaching to be very effective. The results of a study on the use of virtual reality in education are presented in this paper. In addition, it examines the potential benefits of incorporating virtual reality technology into educational programs for higher education.

Key words: virtual reality, immersive, multimedia, nursing, education

Introduction

Immersive virtual reality was the original concept, and the term "virtual reality" (VR) is used for a variety of things. The over-all idea of immersive virtual reality remained developed toward the end of the 1980s.Immersive virtual reality allows participants to interact with a computer-generated world that is a virtual representation of the real world. According to Beier (2004), one of the main features of immersive virtual reality is that the environment is a full-scale, human-sized replica of the real world. As a consequence of this, the participants have the impression that they are interacting with the actual subject or setting.

Real or abstract worlds can be utilized in immersive virtual reality applications. The human body and mathematical concepts are both examples from the real world. Circumstances like these include:
Medical students can operate on virtual patients and practise various surgical procedures in an interactive manner;
An architect can take his/her clients on a virtual tour of the dream home designed, see Easypano (n.d.); or
Different people at different locations can become part of a team, interact with common objects and environments. They can see each other as avatars (virtual humans), and communicate with each other from theirperspectives.

Using virtual reality, we can enter and interact with a world that either does not exist or it is difficult to access due to costs or safety reasons. A virtual environmentor object is created by computer and humans can interact with this environment for the purposes of training or experimentation. 3-dimensional virtual reality images are more dynamic compared with the physical models. Virtual reality will be ideal in situations where:

E. Access to the real object or environment is hard or impossible.
F. Using the actual objects is unsafe or poses a health hazard for the user.
G. Obtaining and experimenting with the real object is too expensive.

Think about how computer-generated reality models could be used in situations where it might be dangerous to use animal organs or have restrictions on it. Bovine spongiform encephalopathy, or Mad Cow disease, for instance, makes it difficult to conduct dissection experiments on animal brains. The application of augmented reality in education is the subject of this study. Two groups of nursing and business students' preferences were compared.

Research Background

A 2002 survey conducted by the author found that visual learning for statistics subjects is preferred by the majority (about 58 percent) of high school students in Queensland, Australia's Darling Downs. Look at Figure 1.

The author and his colleagues' most recent research and studies in multimedia form the project's foundation. According to Nooriafshar and Todhunter (2004), the findings have reaffirmed the significance and effectiveness of visual features in educational materials. The students' preferences for learning modes in relation to the Web Enhanced Multimedia Learning Environment (WEMLE) are shown in Figure 2.The study's instrument was a multimedia-rich, visually stimulating learning environment. The visual features and WEMLE interaction appear to be most popular among the 100 undergraduate and postgraduate students surveyed, as shown in Figure 2.See more information about WEMLE. (http://www.usq.edu.au/course/material/MGT2102/).

In December 2003, the author conducted another formal survey on 34 students at the *Insituto Tecnologico Autonomo de Mexico (ITAM)* in Mexico City. *WEMLE* was used as an instrument in this study. After receiving a seminar on introductory project management, students were interviewed on their experience with the visually rich multimedia system. As illustrated in Figure 3 a vast majority (97%) of them indicatedthat the visual features played a very important role in understanding the concepts.

Current Research in the Field

The Australian *Commonwealth Scientific and Industrial Research Organisation (CSIRO)* scientists have developed a virtual reality system for teaching medical students. This system allows the medical students to interact with virtual organs as if they were touching and manipulating the real ones. Some of the advantages of this digital model as reported by team include:

greater depth and more dynamic features compared with textbookillustrations; and reusability of the models.

See CSIRO Mathematical and Information Sciences (n.d.)

As suggested by RTI International (2004), a combination of the leading edgetechnology and educational theory will produce an advanced learning environment which aims to achieve a cost-effective education. It should be noted that virtual reality's applications in medicine go beyond education. Additionally, the technology can be utilized for disease diagnosis. One area that has been studied is the detection of colon cancer, for instance. Research findings have demonstrated that the virtual colonoscopy approach is much more accurate in detecting malignant cases, as reported in the March issue of Nursing 2004 Magazine (2004) (Pickhardt et al.,2003).Using specialized X-ray images, virtual colonoscopy creates a virtual image that is nearly identical to the colon under investigation.

Proposed Research

The above-mentioned research projects and their findings have inspired the authorsto undertake further research into the visual component of multimedia. It is envisaged that the visually rich multimedia ideas will be taken a step further by enhancing them so that the learner can interact with the subject in a more realistic manner.

The main objective is to explore the possibilities of utilising the leading edge technology of virtual reality with the aim of applying it to Business related topics. Due to the complexities and costs involved with development of virtual reality products, it was necessary to conduct an initial study. The main purpose of this study was to investigate the effectiveness of virtual reality in tertiary education. A suitable package of hardware and software on human anatomy was selected for this purpose. In order to test the medium and the technology involved, it was decided to include both Nursing and Business students. A comparison of the preferences and perceptionsof these two groups would make it possible to assess the teaching effectiveness of the technology on students with different backgrounds.

A virtual reality multimedia on human anatomy was selected for the purpose ofthis research project. The product is called *Human Lab* (http://www.3dworld.com/).

The lecture mode of the Human Anatomy Lab lets the instructor help the student. There are also tutorial and quiz modes included.
24 undergraduate students from the University of Southern Queensland (USQ) were selected at random to test the virtual reality multimedia system on human anatomy. The backgrounds of these students were as follows:

Group 1: 12 Nursing students with formal exposure to human Anatomy;and
Group 2: 12 Business students with no formal exposure to HumanAnatomy.

The purpose was to test the technology and the media rather than the content. This is one of the reasons why a basic human anatomy application was selected.

These learners were provided with Crystal Glasses so that the presentation of photographic quality and truly three dimensional (3 D) images would be possible. In other words an almost real (virtual) presentation of the real objects was presented to these learners. Hence, the learners were able to interact both mentally and physically with the learning materials. The effectiveness of this visual enhancement was measured via a survey instrument. The students were invited to rank their perceptionson a 5 point (Likert) scale for the following 6 different factors:

How much did you enjoy your VR learning experience?
How do you rate the speed of your learning experience?
How do you rate the ease of your learning experience?
How do you rate the relationship between the learning materials and the realworld?
How do you rate the way VR method helped with your understanding of theconcepts?
Would you like to have VR multimedia incorporated into your learningmaterials?

The research instrument consisted of:

an organised VR tutorial;
a structured Questionnaire; and
interview for comments.
Calculation of Weighted Average Index (WAI)

Test of Significance

The combined and separate WAI values of two groups of students were analyzed. And then, Independent Student's t-test was applied to determine whether or not the perception of two groups of students on different factors is significantly different.

Research Outcomes – Students' Feedback

The virtual multimedia system provided striking views of human anatomy. It was interesting to observe some of the students who were fascinated by these images and were trying to grasp parts in front of the monitor which was really an empty space to the observer. These virtual images were produced by combining two slightly offset actual images through the special goggles which alternated (switched on and off) at 30frames per second.

The following statements are some of the comments made by the Nursing and Business students with regard to the virtual reality way of teaching:

VR explains deeper into each concept. I would love to see it introduced in human anatomy because most people need visual expression to understand reality.
I found the VR learning experience was excellent as I was able to puttheory of learning into a practical application, which is very beneficial in a profession such as nursing which requires a hands-on approach. Also it is often difficult to see particular organs in a two dimensional scenario.

I found the experience very positive, also in terms of eliminating completely the hazards of possible infection potentially found in real tissue samples.
The 3 D visual experiences definitely make far better absorption of the material. Also the enjoyment of learning in this fashion far outweighs other methods. This should become available for students; the sooner the better.
The VR experience was great. It has definitely made it easier to retain information. It is easier to learn by visible examples rather than textbook. The availability of this would improve peoples' learning capabilities.
Puts things in perspective-where things are better. You can see where they are in relation to other parts depth, how close etc. Really good.
Catch and maintain attention and interest. Would contribute greatly for learning process, ease understanding, and improve association withcomplex and difficult topics.
Very good, excellent visualisation to reinforce concepts. Makes the outcome easier to comprehend.
Excellent learning aid. I would pay extra to have this sort of learning.

Statistical analysis has revealed that an overwhelming number of students dostrongly agree with the following factors. See Figure 4 and Table 1 for details:

I enjoyed my VR learning experience.
My learning experience speed was very fast.
My learning experience was very easy.
The learning materials were related strongly to the real world.
The VR method helped me greatly with my understanding of the concepts.

Research Outcomes – Statistical Analysis

The combined and separate Weighted Average Index (WAI) values of two group of students on all factors are greater than 0.8. This indicates that on average, students,are in between the *agree* and *strongly agree* choices on all learning factors. In fact, the Overall weighted Average Index value is 0.9264 which is very close to one. Hence, itcan be claimed that the overall importance of this method is very high in terms of students' learning preferences.

Enjoyment and Inclusion into Learning Materials have the highest and equal WAI values (0.975 for both factors), respectively. This demonstrates that the VR Multimedia Method is more significant in relation to those two aspects. However, Nursing students have higher WAI values across the board than Business students do. Nursing students have significantly higher WAI values for enjoyment, real-world perspective, and inclusion in learning materials than business students do. The average WAI, or overall WAI value, of nursing students is significantly higher than that of business students (Table 2).This may be because of the nursing students' backgrounds.

We applied the Independent Student's t-test to determine whether or not the WAI values of two groups of students on different factors were statistically significant. We found that for each factor, the calculated t-values were less than tabulated t-values (Table 3). This shows that the null hypothesis is true, that is, the population WAI values of Nursing and Business Students are not different from each other. For that reason, we conclude that the VR Multimedia method is equally preferred by both groups of students.

Conclusions

It was reported that multimedia that includes a lot of visuals can be very helpful for education. A virtual reality multimedia can even help students learn by incorporating images and visual elements that are more realistic. Accordingly, understudies would have the option to submerge themselves in the climate and participate in unique connections with situations and items. The extremely high t-tests, interview comments, and Weighted Average Indices of this study demonstrate that:
Virtual reality multimedia is very popular for education;
The advantages can be applied to a variety of fields, and the preferences of the two groups are not significantly different.
Future projects will concentrate on the creation of educational virtual reality multimedia for other subjects. For instance, in a typical Production and Operations Management course, Factory Layout would be the ideal application for user interaction.

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Video Games: Issues and Problems

Abstract
Since the 1980s, video games have become ingrained in the lives of young adults. It has an impact on their day-to-day activities as well as how they think and act. In order to guarantee that video games adhere to some kind of restriction or boundary, it is essential to conduct in-depth research into the issues and issues surrounding the influence of video games. Social and technological design have been the two primary topics of discussion. In addition, the connection between education, the current market for the industry, and technology has been taken into account. The parent, the government, and the developer of video games are the three main individuals who have control over the issues.

Keywords— Video Games, Issues, Problems.

Introduction

The number of gamers worldwide has skyrocketed [13].In recent years, a wide range of games have evolved into a large consumer base that spans the globe as a popular form of entertainment [12].Playing games has become one of the primary daily activities for both children and adults due to the increasing number of games produced annually.

Due to their attractiveness, addictiveness, ease of use, engagement, and aesthetic appeal, video games are one type of software or application that is widely available and has the highest demand. Because of these demands, video game developers have employed the most recent methods in artificial intelligence, multimedia, computer graphics, computer simulation, and human-computer interaction in order to make their games more up-to-date and future-proof.

Gaming may be able to assist in addressing one of the nation's most pressing needs—strengthening our system of education and preparing workers for jobs in the 21st century—by allowing players to gain new knowledge and complex skills through game play. The outcome of perplexing computer games exhibits games can show higher-request thinking abilities

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such as adapting to rapid change, problem-solving, interpretative analysis, strategic thinking, and plan formulation and execution.27], [28], [29], [3].However, it is also known that they have numerous negative websites [1–5].The

few problems and issues that will be discussed in this paper will cause everyone to be concerned.Numerous pieces of information must be made public [10].Video games have been around for less than a quarter of a century.Over the course of this time, content, design processes, and technology all had to change quickly and haphazardly.Production methods have remained unstable as a result of the most consistent rapidity of technological advancement.The content has changed the least quickly [10].

PROBLEMS OF VIDEO GAME

There are deuce key topics under this category that are social and technological design issue. The social issue consistsof issue in sexuality, children's development, religion, and culture. The technological design issue consists of interface and environment.

Social Issue

In children and young adults, a meta-analysis of the video game research literature reveals that violent video games increase aggressive behavior, physiological arousal, and thoughts and feelings related to aggression. Pro-social behavior is also reduced when people play video games.

Issue in Sexuality

Despite the fact that Nintendo and Sony do not publish games with sexual themes, sexuality is a common theme in Japanese video games. A Cluster's Revenge, for instance, was controversial due to its racism and sexuality. Larry in Sierra's Leisure Suit is another illustration. It's a computer game where men tried to get women to have sex with him, usually unsuccessfully. The act of showing partial nudity with increasing graphical quality over time is the sexuality issue here.

Issue in Children's Development

According to some psychologists and parents [5], video games cause children to spend a lot of time alone in front of a computer or television rather than running around and playing outside, where they can exercise and develop their social skills by playing with other children. On the other hand, they believe that children's social interaction can be improved by playing video games because many of them are multiplayer games, which let two or more people compete against one another on the same computer screen or television. The children's behavior and performance at school may be impacted by this.

Effect of amount of video game play on school performance

For children, adolescents, and college students, a number of studies [1] have demonstrated a negative correlation between the amount of video game play and academic performance. There is a strong correlation between playing video games for fun and grades in general. According to Harris & William (1985), for instance, high school students who reported spending more time or money on video games received lower grades in English classes. According to a study [3], some students performed well in school because they played video games at home. This was due to the fact that video games like Red Alert, Tycoon Pizza, and Big Fish's Mystery Case Files Raven Hearst required them to think critically and find solutions to problems in order to win.

Effects of violent video game content on aggression Despite the fact that video games are made to be fun, challenging, and sometimes even educational, the majority contain violent content [1].As many as 89% of video games have some kind of violent content, according to a recent content analysis.In an era when parents had to control their children's sports activities for fear that the children would be too tired to study later, playing violent video games increased aggressive behaviors, cognitions, and games.

Technological Design Issues [7], [8], [9]

Gamers' perceptions and evaluations of several aspects of game design and game play were documented, including positive and negative aspects of game interfaces, maps, multiplayer gaming on LANs and the internet, and single player gaming. In terms of technological design, there are numerous aspects that must be considered on par with the evolution of other technologies, such as mobile and 3G.The primary goal of designing highly motivating instructional environments is to help determine what makes video games so captivating. However, the design issue also has important implications for designing other user interfaces.There are a few key aspects of video games that can be incorporated into other user interfaces, as previously mentioned [7].Consider all of the tables and features as a list of ideas to keep in mind when creating new games.However, adding a social component to the list of things to check and consider when designing the game would be extremely helpful.As a result, the designer will precisely identify his target player.

Keyboard & Mouse control[8][9][10]

Academics tend to agree that culture is acquired and transmitted, that it governs behavior, and that it provides rules for behavior, despite disagreements over the specifics of how they view it. Culture has a significant impact on how we view the world and is already influencing how games are designed and perceived. For instance, parents must accept the fact that their children's world has been shaped by video games. Controlling the children's selection of appropriate games and the parents' playing time is the key. In point of fact, in order to ensure that their children get enough exercise, parents must also force them to participate in any kind of physical activity, particularly sports. Before video practical skills, this situation is very different. Video helps improve problem-solving skills, increase perception and stimulation, organize media and tools, and get intelligent answers. Additionally, games can aid in the development of skills and abilities.

Games can be as effective as they are attractive because they teach kids about other worlds and cultures and help them develop spatial and logical skills like seeing things in space and making connections between them.Taking into account factors like gender, age, and academic level, each type of game is associated with learning and education-related skills and abilities:

Arcade and platform games can help develop psychomotor skills and spatial awareness.
Playing dynamic sports and games can help improve psychomotor coordination and reduce stress.
Strategy and role-playing games can encourage internal motivation and reflection on the games' values.
intellect and a mind that can think like a machine.

In conclusion, in addition to the knowledge that can be gained through play, a set of procedural goals that video games can assist in achieving can be outlined. Among them, the following should be emphasized:

Reading. It is absolutely necessary to use video games to encourage book reading that is somehow connected to the game (like The Lord of the Rings).Reading as a value for the process.

logical reasoning Video games help people think about how to solve problems by suggesting strategies, organizing things in advance of goals, and other things.

Observation. This ability is used the most during play because of the number of elements on the screen and the need for visual and spatial discrimination.

Geography, spatiality. The advancement of map making and spatial portrayals: plans, maps, and so forth.
Basic understanding

decision-making and problem-solving These aspects, which are especially crucial in strategy games, are present in all difficult-situation video games.

Planning strategically. This aspect, which is related to problem-solving, can be found in a lot of games that require a lot of mental activity, especially in the most difficult games.

INDUSTRY MARKET

The videogame industry was innovative at first, but it is now joining the mainstream of computer graphics. From 2D to 3D animations, low-end to high-end production technologies, limited in-house tools, and cutting-edge animation production techniques like motion capture and 3D character animation, we see a rapid shift in production. Although the videogame industry is now driving much of the technology development in computer animation, many computer graphics professionals have only recently begun to pay attention to it.
The development of video games is increasingly being included in mainstream media. The commercial transmedia supersystem has arrived, allowing for the proliferation of entertainment content across a variety of marketing avenues. The new delivery systems that support market growth may also influence the evolution of videogame content.

PwC anticipates $12.5 billion in compound annual gains for the gaming industry in the United States between 2007 and 2011.PwC's preliminary estimates for the U.S. gaming market for 2006cq are for the market to have expanded 10.6% to $9 billion, and it expects the first-ever jump beyond the $10 billion mark this year to about $10.4 billion. This year's 15.5% growth will shrink to 3.3% by the end of the period, trailing all other regions. PwC projects that the online gaming market will grow from an estimated $1.1 billion in 2010 to $2.7 billion in 2011, and the wireless gaming market will double, from $499 million to $1 billion, in the United States. However, PwC anticipates that the market for PC games in the United States will continue to decline, falling from $969 million in 2006 to $840 million in 2011.

ARE VIDEO GAMES THAT BAD?

The player's perception of the game and the player's environment can be used to answer this question. The player and the environment around him can make the game as educational as possible; For instance, the parent and his friend see the game as a way to teach. Nonetheless, even the instructive game can make awful impacts on the off chance that the player simply focuses on the game and not doing some other thing.
There are video games made specifically for adults. Children should never play games of this nature. Adults should be able to tell whether a game is beneficial (they should only view it as entertainment) or detrimental due to its maturity. Entertainment is merely a means of mental relaxation. As a result, the game ought to be perceived appropriately. However, the game has the potential to easily influence some adults. The player doesn't do anything wrong because of the game; rather, the player has other problems that cause him to do anything wrong. The video game and music are similar in that they serve as supplementary motivations for bad behavior.

WHAT VIDEO GAMES DEVELOPER CAN DO?

Naturally, the video game developer focuses more on the technology. The design, components of the Human Computer Interface, and the integration of current technology into games are all part of the technology. No matter how the game was made, when it's finished, players will be happy and have fun. Because of this, the game is developed using a prototyping approach rather than a step-by-step approach. The majority of the game development is therefore difficult to track and maintain. Researchers in software engineering can conduct extensive research on the game's methodology to guarantee its ongoing upkeep.

When creating a video game, two main considerations for the game developer are its attractiveness and addictiveness. For instance, a game with all of its educational components will not have any players if it lacks appeal and addictiveness. As a result, the player will not receive the content. Based on software metrics, the developer must thoroughly examine, review, and define the meanings of attractiveness and addictiveness. Additional factors ought to be taken into account in addition to the items on the check list in tables I, II, and III. It is important to consider the aspects that have a greater impact on society. As a result, the developer can only clearly define a select group of players or ages. If the game has educational components, in addition to the social impact, the developer can use another checklist to determine the player's benefit, such as procedural objectives, skills, and abilities. As a result, both the parent and the teacher will be able to determine whether or not the game is suitable for the player.

similar system for audio and video. The game controller that was used to interact with the game is required for console games. The majority of the time, the player is always having issues with the controller. Naturally, parents should be aware of every game their children play. The game is currently available for mobile devices as well as personal computers and consoles. At first, the game's purpose is relaxation and socialization, not education. Parents should only be aware of the content. In addition to the content, the children's playmates must be taken into consideration.

It's bad for your mind and body to play video games too much. It is suggested that parents give their children some time each day to play the game. There are additional times when you should engage in physical activity and spend time with friends or even family..

Government
The entire content of video games must be monitored by the government. In today's world, no nation has a single religious adherent. At least two religions will exist. As a result, maintaining peace in the nation necessitates the unity of people of various faiths. Same thing goes to the political conviction. It is feared that a game that makes fun of any one of these could harm the nation's unity and peace. The worst thing that could happen is that it could cause racism and political problems. A nation can suffer significant harm as a result of the influence.

TECHNOLOGY

Video games and video games are frequently used interchangeably. Regularly there is a screen (TV, screen and LCD show) through which the game is seen. Typically, input devices include a controller, joystick, keyboard, or keypad. This varies depending on the game and the hardware. The majority of video games can basically be thought of as simulations in some way. Modern car racing games, business simulations, sports, combat, and civilization development games are examples of realism-based simulations. Console games, handheld games, personal games, and arcade games are the four categories of games [26].

Handheld Game
A video game made for handheld devices is called a handheld video game. This primarily referred to handheld game consoles like Nintendo's Game Boy line in the past. There are no reprogrammable cartridges or disks for handheld video games. Due to the device's small size, handheld devices have significantly fewer controls than other systems. Because of the limited amount of time, the average game time is significantly shorter, and the games cannot be complex [25].

Console Game
A console game is a type of interactive multimedia that is played for fun. The game has manipulable images that are generated by a game console and shown on a television. Strategy games, on the other hand, typically have

console controllers that don't let you move quickly or accurately. On account of typical control center, a TV is the most widely recognized type of screen utilized. The most challenging aspect is that, in order to utilize advanced graphics, particularly in animation, the consoles used large televisions as their visual output. The console games are frequently shielded from tampering by physical and legal barriers [25], making them difficult to modify without a proprietary software development kit.

Personal Computer Game

A PC game or personal computer game is played on a personal computer. The gameplay and graphics of the game are now more complex; like Space war; to a wide variety of titles with more advanced visuals. PC game development is typically done by one or more game developers with proprietary or standard tools. Previously, games could be made by a small group of people, but nowadays, many popular computer games need large teams and millions of dollars to make [25].Therefore, in order to accommodate rapid design and prototype modifications during development, a tightly controlled software engineering lifecycle is required. In addition to managed development, this kind of development necessitates an effective design and documentation strategy.

Arcade Game

An arcade game is a type of coin-operated entertainment system that is typically found in commercial areas like video arcades, restaurants, and family entertainment centers. Reward games, merchandisers, video games, and pinball machines make up the majority of arcade games. Games that require specialized controllers, which are largely inaccessible to home users, have carved out a niche for arcades today. The fact that the machine needs to be maintained constantly is the primary issue with this game technology.

CONCLUSION

A video game is one in which the player uses a controller's interface to provide visual feedback on a video screen. It can be played on a television or personal computer at home, in an arcade, or as a handheld portable game. Since the game became one of people's favorite activities these days, there have been numerous issues that have been addressed and discussed. The issue should have been addressed with a great deal of effort. Because of the rapid advancement of technology, there should be fewer issues. The use of gaming, its main features, and interactive media in various contexts, including design and social issues, will be examined in issues on video games. The case against gamers would be stronger if it could be demonstrated scientifically that they develop an addiction to role-playing games. Addictions are compulsive behaviors that endanger the lives of those who engage in them.

The combination of compulsiveness and negativity is the key to understanding why we view addictions as harmful. Taking into account factors like gender, age, and academic level, each type of game is associated with learning and education-related skills and abilities. It teaches about other worlds and cultures, develops imagination and problem-solving skills, and encourages the development of spatial and logical skills like visualizing and relating objects in space, organizing multiple factors with a goal in mind (thinking strategically), among other things. The videogame industry has been a bit of a paradox in comparison to the rest of the high-tech world.

Video games have been around for less than a quarter of a century. Over the course of this time, content, design processes, and technology all had to change quickly and haphazardly. We believe that the most revolutionary and original feature of the video game industry is interaction. Nowadays, interactivity is something that people expect, and it tends to be a big part of all applications. Obviously, video games go much further down this path because they are increasingly being referred to as interactive systems in the broadest sense. Instead of being solely the result of a marketing strategy, games are increasingly the product of a genuine co-creation processin which players contribute to the game's gradual evolution through their own personal input.

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