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Technological Disruptions That Have Transformed Business

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Abstract - This research study looks at how technological disruptions have changed the business landscape. Application Programming Interfaces (APIs), Augmented Reality (AR), Virtual Reality (VR), Artificial Intelligence (AI), Internet of Things (IoT), and Chatbots are among the primary focus areas. The study seeks to give insights into how disruptive technologies have transformed different parts of business operations, such as customer interaction, operational efficiency, decision-making processes, and Chatbot. This research study provides a deeper understanding of the transformative influence of these technologies on businesses through a comprehensive assessment of existing literature, case studies, and industry examples. The findings show the significance of embracing technological disruptions in order to achieve a competitive advantage in today's quickly changing corporate environment.

Key Words: Application Programming Interface (API), Augmented Reality (A/R), Virtual Reality (V/R), Internet of Things (IoT), Chat Bot, Natural Language Processing, Disruptions.

1. INTRODUCTION

The way the business industry has changed over the years due to the recent technological innovations such as APIs, AR, VR, AI, IoT, and Chatbots has given a chance to the world to evolve their own business and make the work easy. These technologies have altered the way customers are engaged and optimized their operations and managed their customer. To be able to understand how these technologies make organizations grow and evolve and to be competitive in this technological era.

This Research paper gives an in-depth analysis of recent technological disruptions and specifies certain companies that have implemented these technologies in their business model for their profit and transformed the corporate landscape. The terms were chosen- APIs, AR, VR, AI, IoT, and Chatbots display key areas where disruptive changes have taken place in various industries. By evaluating each of these technological terms we will be able to identify the impact that has transformed the industry's working methodology. The following paper aims to provide information about the various ways in which organizations have been changed.

The paper will look at the role of APIs in facilitating the seamless integration of systems and services, which leads to improved connection and cooperation. It will explore how AR and VR will help to upgrade the customer's services, work optimizations, help to create a learning environment for the new generation, and create new opportunities for an organization to improve their business. This research work will give u details regarding how AI will help to automate work, help in the decision-making process, and will in turn help to discover new methods to improve existing technologies. Furthermore, the effects of IoT on linking physical objects, producing huge amounts of data, and providing real-time insights will be addressed. Finally, the paper will take a peek at AI Powered Chatbot and how these bots change the current market and Engage the Customer Relationship Management.

This research paper attempts to provide a complete knowledge of the disruptive nature of these technologies and their transformative effects on organizations by analyzing current literature, case studies, and industry examples. The findings will be a great resource for companies, governments, and researchers, emphasizing the necessity of accepting and harnessing technology upheavals to continue to thrive in an ever-changing business context.

2. OBJECTIVES OF THE STUDY

Organizations that do not embrace digital transformation may find themselves falling behind on competitors and losing out on potential innovation and growth opportunities. As the business environment is changing at an unprecedented pace, it is becoming increasingly important to balance continuity and change to achieve long-term success. This paper aims to serve two objectives. Firstly, to give a detailed overview of recent Technologies that are changing the Business process to the next level, especially after this Covid-19 pandemic. Secondly, To give an overview of the major tools (Software) that helps the Business to boost its performance in the market.

3. RESEARCH METHODOLOGY.

This section describes the study approach taken to examine how the Chatbots, the Metaverse, and API integration may help businesses grow. A qualitative design was used in order to successfully address the study objectives. A literature review methodology was employed for this work, which entails a thorough investigation and synthesis of previously published papers and pertinent articles found online, in academic databases, and in credible industry magazines. However, only after discussion amongst industry professionals in IT and Non-IT Businesses were conclusions made.

4. DISCUSSIONS

4.1 API (Application Programming Interface):

One of the most Trending Technologies that has changed industries to the core is API that is (Application Programming Interface)

Applications can communicate and interact with each other using a set of instructions, protocols, and tools referred to as APIs.

4.1.1 How It Works

APIs act as a contract or interface that defines how software components should interact and communicate with each other. The developer and documenter for an API define the available endpoints, request types, required authentication steps, and expected responses. The client application makes a request to the API in the prescribed way with the necessary authentication and payload data. The API processes the request by getting access to the necessary assets, performing tasks, and generating a response. The client gets the reply, containing the details they have asked for or the results of the action that was requested. Developers can use the services and features offered by APIs to promote effortless interaction, interoperability, and modularity between software systems.

4.1.2 How companies will use:

Third-party integration: Integration using Third Parties: With the use of APIs, organizations may include services or data sources via other platforms or applications. For instance, a travel booking website might connect with airline APIs to supply consumers with real-time information on flight availability and costs.

Platform-as-a-Service: Some companies provide APIs in their platform services, allowing developers and companies to build applications on top of their infrastructure. Access to the many services, resources, or functionalities offered accessible by the platform provider is standardized because of these platform APIs.

4.1.3 Disruptions:

Map box is a mapping and location-based services provider that offers a variety of APIs (Application Programming Interfaces) that allow developers to integrate their mapping technology into their own apps.[2]

- Revenue Generation: Map box provides a variety of premium APIs, allowing them to create revenue by charging developers and businesses to use their mapping services. Map rendering, geocoding, routing, and navigation are among the APIs available to developers that subscribe to Map Box's subscription plans.
- Data Collection and Improvement: By incorporating Map box APIs into their products, developers help to collect location-based data. Map box may then utilize this information to improve their mapping services, improve map accuracy, and build new features depending on user requests.
- Customization and Innovation: APIs enable developers to harness Map Box's mapping features and customize them to meet their own requirements. This adaptability enables developers to create one-of-a-kind applications and experiences using Map box's mapping technology, demonstrating the versatility and promise of Map Box's services.
- Integrations with Partners: Map box's APIs enable them to integrate with other firms and platforms. They have relationships with firms like Airbnb, Instacart, and The Weather Channel, for example, who use Map Box's mapping technology to improve their own services. These collaborations help Map box grow its awareness and user base.
- Overall, Map box can increase the reach of its mapping technology, make cash, collect useful data, nurture a developer community, and establish strategic alliances by giving APIs, all of which contribute to the company's growth and success.

4.2 AR (Augmented Reality)

Augmented Reality (AR) involves overlaying computer-generated content onto a real-life environment, such as images, videos, or 3D models, so the user can enhance their perception and interaction with it. By blending digital elements with the real world in real-time, users can view a composite view that combines virtual and real objects.

AR allows users to sort out different problems in Real-life using a device such as a smartphone, tablet, or smart glasses. First, the device Captures the real-world environment and

overlays virtual elements onto it to fit in with the real-world environment and these generated elements can be responsive and interactive to the users' response so that users can set their perspective.

Imagine you went out for shopping and u want to buy a shirt or a jacket but you want to know about the brand rating, the quality of the shirt/jacket and feedbacks from other people who have already used it.AR-enabled smart glasses show all the details relating to the product and this is one of the disruptive technologies that will overall change the world into a new era.

4.2.1 Domains: AR in Logistics:

- AR in logistics has great benefits to improve the logistics Industry. AR gives access to gain real-time insights to improve real-time operations and accuracy.
- AR helps the logistics staff to automate tasks such as data gathering and information accessed by using wearable Smart glasses. Wearable smart glasses contain all the necessary data. It reduces the specific task such as Order picking and there is more room for productivity.
- Security is given one of the top priorities in this domain.
- For Example, shipments can be tracked and watched to ensure that they are delivered securely and safely using AR-enabled devices.
- Operators can immediately identify and fix any faults with the use of AR, which may offer real-time data and insights into the logistics process. Thus, delays are decreased, and customer satisfaction is raised.

4.2.2 Disruptions of AR:

DHL is an American-founded German logistics company providing courier, package delivery, and express mail services they have implemented AR services to fasten the process of selecting the correct package and shipping it to the right location.[6]

These use cases are arranged based on the company trends:

1) **Warehousing Operations:** They are projected to account for 20% of all logistics costs after the introduction of AR in operations, while the task of picking accounts for 55% to 65% of the overall cost of warehousing operations. This represents the reduced cost of these operations and will benefit the company to gain more profit and reduced cost. These AR-enabled technologies will also help the new trainers in their workflow.

2) **Transportation Optimization:** If a delivery is finished and available for pickup, AR devices record that information.
- Recording the amount and numbers of pallets and packages using markers or cutting-edge object recognition technology.
- Automated confirmation of pick-up by AR following identification of the correct quantity of undamaged packages
- Primary goals: time savings, complete verification, and damage detection.

3) **Last-Mile Delivery:** According to estimates, drivers don't drive for between 40% and 60% of their time away from the distribution center. Instead, they spend a large portion of their time searching for the appropriate packages within their vehicle for the subsequent delivery. Drivers currently must rely on their memory of the loading procedure to locate a package. By using, AR gadgets to scan a particular item, each driver may gain vital information about that package. This information may include the kind of cargo being delivered, the weight of each package, the delivery address, and whether the package is delicate or needs to be placed a certain way to prevent harm. The system might then determine where each item should be placed in the car while considering the intended route, scanning the vehicle for an available vacant spot to fit the parcel.

4) **Upgraded Value-added Services:** AR can enable logistics companies to execute new services for their clients, such as assembly and repair, as well as give new customer support tools, in addition to assisting them in improving their processes.

Overall, AR can be one of the most Disruptive technologies that will help in revolutionizing organizations.

4.3 VR (Virtual Reality):

Virtual Reality (VR) is a computer-generated environment featuring realistic-looking images and objects that immerses the viewer in their surroundings. A virtual reality headset, helmet, or other equipment is used to view this environment. VR helps us to learn how to conduct heart surgery, better our sports training to increase performance, and immerse ourselves in video games as if we were one of the characters.

4.3.1 Domains: VR in gaming:

Video games have become an important entertainment medium in the twentieth century. Its importance is gaining

more popularity throughout the world, using mobile phones, tablets, and any handheld devices anyone can play and it opens up new businesses in the entertainment industry in the past few years, it has been taken to the next level by upgrading the gaming environment using VR (Virtual Reality).[5]

The gaming industry was changed forever by virtual reality, which also enhanced user experience. VR-driven applications in gaming offer several advantages.

- Offers tempting virtual items to players.
- Give participants the option to join the game in real time.
- Cutting-edge features that improve the gaming experience.
- Digitally expanded reality at all times and places.

For Example: "Half-Life: Alyx" is a virtual reality game created by Valve that takes place in the "Half-Life" universe. Players assume the character of Alyx Vance, who uses VR mechanics to interact with items, solve puzzles, and engage in fierce combat while traveling through a dystopian world. "Half-Life: Alyx" demonstrates the possibilities of immersive gameplay and in-depth storytelling in VR.

4.3.2 Disruptions of VR:

The French bank BNP Paribas has conducted virtual reality experiments to demonstrate how the technology would transform the current retail banking sector. The business has developed a program that enables users to view account activities in a virtual setting. The application also includes e-learning features, such as a VR tour of the home loan application process for customers. This program offers a glimpse of a time in the future when virtual sites for banks can take the place of actual ones. For banks, many of them are battling to maintain a sizable number of brick-and-mortar locations, this would be a significant problem-solver. Banks might engage with a bank from any location at any time of day by switching to a virtual solution, which would also allow banks to dramatically reduce real estate, building, and employee expenditures.

4.4 IoT (Internet of Things):

The Internet of Things describes the network of physical objects things that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the Internet

4.4.1 Domain: Banking:

The Transaction which we are using to send the payment directly to the exact person whom we are sending the money

- The Money which is kept in the account will be safer compared to the cash we are keeping
- Bank provides the interest for the money which you kept in a bank, helping to protect your money against inflation
- Bank provides personal loans based on your work for a salary which you are getting monthly
- if you are sending money to other people you don't need to go to a bank you can send money directly to a person through banking

4.4.2 Disruptions in Banking:

Contact-less credit card used by American Express, like other credit card companies, American Express offers contactless payment options for its credit cards. Through the use of near-field communication (NFC) technology, contactless credit cards enable cardholders to make purchases by merely touching or waving their cards in close proximity to a contactless payment terminal.[3]

- Improved consumer experience: Cardholders that use contactless payments enjoy a quicker, more practical, and frictionless payment process. American Express can increase client happiness and loyalty by providing this technology.
- Increased transaction volume: Since contactless payments are quick and simple, cardholders are more likely to make frequent and impulsive purchases. American Express may see an increase in transaction volume and earnings as a result of this.
- Advantage in a competitive environment: Companies using contactless credit cards are fewer. So American Express has an advantage here who offers this service for the users. Users will be using the easy services that will benefit them. So that the transactions will take place without any delay.
- Improved security features: Tokenization, a built-in security feature of contactless payments, replaces cardholder data with individual tokens during transactions. This lessens the possibility of fraud and helps safeguard cardholders' private information of cardholders. American Express may underline its dedication to security and draw in clients who are security-conscious by pushing contactless payments.

By providing contactless payment technology, American Express has enhanced customer satisfaction, boosted transaction volume, maintained competitiveness, capitalized on the rising popularity of contactless payments, strengthened security, and broadened merchant acceptance. The expansion and achievement of the organization in the payments sector are facilitated by these advantages.

4.5 Artificial Intelligence

Artificial intelligence is the recent technology that has taken the world to its next step in technology. Ai helps machines to think and give us an output based on the data that we are providing.
With the use of Ai, the tech industries are developing multiple applications that will automate the work of humans in real time.
Ai is also used to predict scenarios using machine learning algorithms and deep learning concepts.

4.5.1 Domains:

Computer vision is projected to be the automatic extraction, analysis, and comprehension of the most valuable information from a single image or a succession of images, based on the theories and algorithms that enable computerized visual interpretation. It is also portrayed as a more sophisticated kind of image processing in which an image is received as input and interpretations of the image are output as results. Overall, the objective of computer vision is to replicate or outperform the human brain's capacity to view the environment. Either way, humans are the most advanced form of life and have existed and computer vision helps in the advancement of technology in one way. AI (Artificial Intelligence) improvements are leading to additional advancements and upgrades in computer vision technology, resulting in better and more reliable visualization.[4]

AI has made a big impact in the field of computer vision, some of the notable applications are:

1) **Autonomous Vehicles:**

Computer vision algorithms and Ai techniques like sensor fusion and path planning so after combining these two technologies the vehicle perceives the data and detects obstacles by understanding the current environment and making decisions on time.

2) **Security and Surveillance:**

Computer vision systems that are powered by AI are frequently utilized in surveillance and security applications. They can keep an eye on real-time video feeds, spot suspicious activity or items, follow people or cars, and issue alerts or notifications when there may be a danger.

4.5.2 Disruptions of AI:

NVIDIA: NVIDIA is a technology company that specializes in AI acceleration and graphics processing units (GPUs). Their GPUs are frequently employed for deep learning model training and execution in computer vision applications. The advancement of AI in computer vision has been considerably aided by NVIDIA's hardware and software solutions.

After the advancement of Ai Nvidia has gained much profit with their GPU's and Nvidia had developed deep learning frameworks that have become an industry standard that will help in ai and computer vision research.
Ex: Popular NVIDIA GPU-optimized frameworks like TensorFlow, PyTorch, and Caffe enable programmers to quickly train and deploy computer vision models.

4.6 Chatbots

The development and study of intelligent hardware and software, often known as intelligent agents, is a key component of artificial intelligence's (AI) growing integration into our daily lives. Intelligent agents are capable of performing a range of jobs, from simple manual labor to complex procedures. A chatbot is one of the simplest and most common forms of intelligent Human-Computer Interaction (HCI) and a classic example of an AI system [1]. It is a computer program, which responds like a smart entity when conversed with through text or voice and understands one or more human languages by Natural Language Processing (NLP) [7].

Chatbots are "online human-computer dialog system[s] with natural language." [8] The first conceptualization of the chatbot is attributed to Alan Turing, who asked "Can machines think?" in 1950. [3] Since Turing, chatbot technology has improved with advances in natural language processing and machine learning

After the COVID-19 outbreak in 2020, a number of organizations heavily implemented chatbots to address customer inquiries and provide associated supplemental data. Due to the enforced lockdowns, the majority of firms adopted remote working. As a result, organizations were heavily reliant on chatbots to reduce the workload of customer inquiries due to the limited availability of customer care staff.

With a market share of 30.34% in 2022, the retail & e-commerce class led. There are several industries where chatbots are used, including healthcare, retail, BFSI, media & entertainment, travel & tourism, e-commerce, and others. Due to features like virtual presence and distant connectivity that significantly lower transportation costs, chatbots are becoming more and more popular in a variety of industries.

4.6.1 Domain: AI Bots in Business Industry

Earlier chatbots could only acquire the most fundamental facts and information. The use cases for chatbots have greatly grown as a result of the development of bots that can

undertake complicated tasks; as a result, they have changed the game for small enterprises. They are crucial tools for providing straightforward answers, interacting with clients, gathering data, gathering leads, and boosting sales.

4.6.2 Business challenges:

- Lack of time and money.
- Building long-lasting relationships with customers.
- Scaling their business.
- Building email lists and finding leads to boost their business.

4.6.3 Disruptions of AI Chatbots:

With a predicted market share of 42.57% in 2022, the mobile application sector was predicted to dominate. A CAGR of 23.8% is anticipated for the social media industry throughout the estimated time frame despite its rapid growth. Chatbots on social media are advantageous for businesses and time-saving for customers. The main function of the social media chatbot is to provide clients with immediate assistance throughout the day, regardless of when the company is open for business.

Due to the increased usage of chatbots by the finance department to reduce the company's running costs, the finance category is anticipated to grow at the quickest CAGR of 24.0% from 2023 to 2030. As they can manage a high volume of enquiries without the need for extra people, chatbots can lower the expenses associated with providing customer support and service.

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5. CONCLUSIONS

Based on the extensive research conducted on technological disruptions that have reshaped the business landscape, several key findings emerge:

1) **API Integration:** The introduction of Application Programming Interfaces (APIs) has resulted in a paradigm change in how various systems and services interact and communicate with one another. APIs are already being used by businesses to easily connect third-party services and data sources, resulting in enhanced customer experiences and increased operational efficiency.
2) **AR and VR:** AR and VR technologies have changed several sectors, including logistics and gaming. AR has improved logistics operations by automating jobs, increasing security, and delivering real-time data. VR has revolutionized the gaming business by providing realistic and participatory gaming.
3) **Internet of Things (IoT):** The Internet of Things (IoT) has played a critical role in linking physical items and creating massive volumes of real-time data. This data-driven strategy has given organizations the ability to make data-driven choices, improve operations, and provide better customer experiences.
4) **Artificial Intelligence (AI):** AI technologies have been essential in automating activities, enhancing decision-making processes, and forecasting future scenarios. AI has enabled substantial advances in object identification, image analysis, and security applications in fields such as computer vision.
5) **Chatbots:** Over 60% of users prefer to use a customer service bot instead of waiting for a human agent to answer their requests? It seems like chatbots are becoming the new norm when it comes to customer service.

- 24/7 service the most helpful for customers? In fact, according to The Chatbot study, 64% of consumers say so! Knowing that your company offers support regardless of the time of day can be a factor in deciding whether to buy your product.
- 90% of businesses say they've seen significant speed improvements in complaint resolution? What a way to increase customer satisfaction.
- 80% of customers who have used chatbots report the experience as positive? That's a pretty impressive satisfaction rate. So if you're looking to improve your customer service, chatbots could be a great option.

In conclusion, the study offers in-depth insights into the transformational impact of technology disruptions on numerous facets of corporate operations. APIs have promoted seamless system integration and data transmission, resulting in increased efficiency and collaboration across sectors. AR and VR have transformed customer service, logistics, and gaming experiences, providing organizations with unprecedented opportunities to communicate with their

consumers. IoT has unleashed the power of real-time data, allowing for data-driven decision-making and improved consumer engagements.

The findings emphasize the need of embracing technology disruptions in order to gain a competitive edge in today's rapidly changing corporate landscape. Organizations that use disruptive technology may improve customer happiness, improve operational efficiency, and remain ahead of the competition. Adoption of these disruptive technologies has become critical for long-term development and success as the corporate environment advances at a rapid pace.

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