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11	Ms Tarushi Acharya	Presented paper in international confernece on comparative law Amity University held on Feb 18-19,2022	Blockchain uses for smart contract Arbitration	Paper presentaion

12	Ms. Tarushi Acharya	Paper presentaion in National Conference on Social impact of Digitization(NCSID-2022	Post modern social impact of Internet addiction :the penologicalConundrum	Paper presentaion
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“IOT Applications in Fire safety”

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Abstract:

Change and progress are taking place right now. The world is turning more and more toward technology. The safety of new construction is a problem in the modern day. As the population grows, more and more structures are needed. Accidental fires occur in various types of structures for a number of reasons. If we look at the past several decades, we have seen a number of fatalities brought on by building fires. Every year, our nation suffers financial losses as a result of fire catastrophes. The biggest worry right now is how to prevent these fire incidents in buildings with high ceilings. Traditional fire detection methods are unable to stop such mishaps. Additionally, they are unable to alert owners about fire incidents.

Additionally, they are unable to alert owners about fire incidents. IOT has a significant role to play in this. Internet of things, or IOT. These fire mishaps can be completely prevented or controlled by IOT.

IoT holds one of the leading positions in technological growth across the globe. Following computers, the Internet, and mobile communications, it is another sector of the information economy. Firefighting, fire monitoring, and safety management systems are crucial uses for Internet of Things technology. It talks about the IoT system framework for planning, monitoring, and battling fires.

Building fire accidents can be controlled using an IOT-based fire detection system. An IOT-based system can offer the finest security for tall buildings. The owner, user, alarm, etc. will receive a message alerting them of the fire from an IOT-based fire detection system that can detect temperature, smoke, short circuit, and other factors. In order to take safety precautions, it can also send an alarm message to the local fire department and police system.

Multiple sensors, a communication system (Bluetooth, GSM, NodeMCU), motion planning (manual patrolling), and an Android application for manual system patrolling make up the Fire Detection System. For safety reasons, this fire detection system can be employed in academic institutions, workplaces, and businesses.

In-depth discussions of the IOT, IOT-based fire detection systems, and IOT applications that can be used to improve building fire safety are covered in this article. Additionally, it covers how IoT and wireless sensor network technology might be applied to meet firefighting needs.

Keywords: Information and communications technology (IoT), the National Fire Protection Association (NFPA), Portable Appliance Test (PAT), Building Management Systems (BMS)

1. Introduction

[16]It is a real thing with a tangible Internet connection. It may be a thermostat, lock, appliance, fitness tracker, or even a light bulb.

Imagine having shoes that monitor your heartbeat and alert you to any potential health issues. There are already "smart" shoes on the market, so you don't need to imagine!

The idea behind the Internet of Things is actually rather straightforward: it entails linking all of the world's physical locations and objects to the internet.

In the coming five years, the Internet of Things will bring about significant changes. And even while smart devices are exactly that, the IoT sector still needs to make security improvements on a broad scale. Today's IoT gadgets are frequently hurried to market with little regard for fundamental privacy and security safeguards: "Insecurity by design."

This puts you and everyone else in danger since you could unknowingly be watched, have your data stolen, or even lose the ability to lock your own door. You might even join a botnet that targets the Internet. Millions of other vulnerable webcams, including your own, might be utilised to assault a nation's electrical supply.

The Internet of Things includes everything from dental sensors that can track what a person eats to cat litter that can record a cat's every step. Can you distinguish between the real and fake?

The emergence of the Internet of Things is one of the most rapid and fascinating advances in information and communications technology (IoT). Despite the fact that networking technologies have proliferated over the past 20 years, up until recently they were mostly used to link up traditional end-user devices like mainframes, desktop and laptop computers, and, more recently, smartphones and tablets.

In recent years, a significantly wider variety of devices have been connected to the network. Vehicles, home appliances, medical equipment, energy metres and controllers, street lights, traffic lights, smart TVs, and virtual assistants like Amazon Alexa and Google Home have all been included. Industry analysts predict that by 2020 there will be more than 25 billion of these devices connected to the network, up from an estimated eight billion at present. New use cases for network technologies have been made possible by the growing deployment of these devices. According to some estimates, the IoT might bring in up to US\$13 trillion by 2025 [16].

Why IoT Matters

[23]When something is connected to the internet, it can send, receive, or do both when it comes to information. Things become "smart" due to their ability to send and/or receive information.

Let's use smart phones as an illustration once more. You can listen to almost every music in the world right now, but it doesn't mean that your phone truly has every song ever recorded on it. The reason for this is because while your phone can communicate information, every song in the world is kept somewhere else.

(asking for that song) and getting the answer (streaming that song on your phone). A item only needs access to information in order to be intelligent; it is not necessary for it to contain super storage or a super computer. Connecting to super storage or a super computer is all that is

required of a thing. All devices connected to the internet fall into one of three categories in the Internet of Things:

1. Devices that gather data and transmit it.
2. Things that behave after receiving information.
3. Things that do both functions.

And each of these three has tremendous advantages that build on one another.

1.1. Collecting and Sending Information

You can use any type of sensor, including temperature, motion, moisture, air quality, and light sensors. These sensors, when combined with a connection, enable us to automatically gather environmental data, which then enables us to make better informed judgments.

On a farm, automatically gathering data on the soil moisture can help farmers determine when to irrigate their crops. Instead of using irrigation systems excessively (which might be costly) or watering too little (which can be an expensive loss of crops),

The farmer can control how much water is applied to the crops. Farmers can do this to boost crop productivity while cutting costs related to it.

The same senses that humans use to make sense of the world—sight, hearing, smell, touch, and taste—help robots (and the people who oversee them) do the same.

1.2. Receiving and Acting on Information

Machines that gather data and take action are something we're all extremely accustomed to. A document is sent to your printer, who prints it. Your automobile's doors unlock when your car keys send a signal. There are countless examples.

We know that we can instruct machines from a distance, whether it be as basic as sending the command "turn on" or as complex as sending a 3D model to a 3D printer. Then what?

When objects are capable of both of the aforementioned, the Internet of Things reaches its full potential. Things that gather data, send it, as well as receive data and act on it.

1.3. Doing Both: The Goal of an IoT System

Let's fast return to the farming illustration. You don't actually need a farmer; the sensors can gather data about soil moisture to advise the farmer on how much to irrigate the crops. Instead, depending on how much moisture is in the soil, the irrigation system can automatically activate as needed.

You can go even further with it. If the irrigation system receives weather data from its internet connection, it may also be able to predict when it will rain and decide not to water the crops today as the rain would take care of it.

Furthermore, it goes beyond! It is possible to gather and send data on the soil moisture, the amount of irrigation watering, and the actual growth of the crops to supercomputers that can process the data using incredible algorithms.

That's only one type of sensor, by the way. These algorithms can learn considerably more when other sensors, such as those for light, temperature, and air quality, are included. These algorithms can produce amazing insights into how to make crops grow the best, contributing to the world's food supply, with dozens, hundreds, and thousands of farms gathering this data. And among the countless IoT uses, agriculture is just one...[23]

2. Main components used in IoT:

[20]• **Low-power embedded systems:** Less battery usage coupled with high performance are the opposing factors that are crucial in the development of electronic systems.

• **Sensors:** A sensor is a critical component of any IoT application. It is a physical device that measures and detects a physical quantity and converts it into a signal that may be provided as an input to a processing or control unit for analytical purposes.

1. Different types of Sensors :
2. Temperature Sensors
3. Image Sensors
4. Gyro Sensors
5. Obstacle Sensors
6. RF Sensor
7. IR Sensor
8. MQ-02/05 Gas Sensor
9. LDR Sensor
10. Ultrasonic Distance Sensor

2.1. Modern Applications:

1. Smart Grids and energy saving
2. Smart cities
3. Smart homes/Home automation
4. Healthcare
5. Earthquake detection
6. Radiation detection/hazardous gas detection
7. Smartphone detection
8. Water flow monitoring
9. Traffic monitoring
10. Wearables
11. Smart door lock protection system

12. Robots and Drones
13. Healthcare and Hospitals, Telemedicine applications
14. Security
15. Biochip Transponders(For animals in farms)
16. Heart monitoring implants (Example Pacemaker, ECG real time tracking)[20].

3. Leading Causes of House Fires

[17]Several of the most frequent reasons for house fires have been recognised by the National Fire Protection Association (NFPA). The following are some of them.

1. Appliances and Equipment

Any appliance that produces heat (such as heaters, clothes dryers, and computers) or warms up over time (such as fans and computers) poses a risk of catching fire. Unattended cooking equipment is a common source of preventable fires.

2. Candles

A burning candle should never be left unattended, according to the warning label on every candle. But many candles might burn out of control since they are frequently overlooked. On Christmas Eve, Christmas Day, and New Year's Day, candle fires are most likely to happen.

3. Holiday Decorations

During the winter holiday season, fatal fires aren't just started by candles. The obvious offenders are illuminated holiday decorations and Christmas trees. Live trees that are neglected and allowed to dry out are simple pickings for hot lights to burn down.

5. Electrical Systems and Devices

Any electrically powered device has the potential to cause a fire, but overheated lighting equipment tops the list. Inadequately done electrical work in a home, such as loose wires, poorly grounded circuits, and poorly connected circuits, can also be dangerous.

6. Smoking

The result of careless smoking behaviours is one of the most frequent causes of house fires. Smoking can occasionally cause people to nod off. They run the risk of starting a fire in their couch, bed, or other furniture, which is sometimes fatal. Throwing still-hot ashes into a garbage can, where they could ignite, is another preventable risk.

7. Chemicals and Gasses

Natural gas or propane gas sources can quickly start home fires. A combustible condition can be produced by an accidental spark and a little leak. Combustion can also be caused by improperly combining household chemicals, thus it's crucial to carry out such work outside the home.

8. Lightning

In the summer, when afternoon and early evening storms are at their strongest, lightning fires are most frequent. Homes in densely forested settings are particularly susceptible to lightning strikes that might ignite the surroundings.

9. Children

One of the main causes of house fires is young children playing with fire or matches inadvertently inside the house. Younger children who are aware of the dangers of fire and simply want to watch what happens are just as dangerous. Talking to kids about how reckless conduct around fire can be damaging might help prevent potential disaster, even though it may not be easy to completely quell their interest.

10. BBQ Grill

In comparison to other seasons, the summer is the worst for this. There are a number distinct factors, such as closeness to combustibles like dry grass or a gas leak, that might cause an uncontrolled flame to start on a barbeque grill. Cooking on stone or another flame-resistant material or keeping a close eye on an active grill will reduce the chance of these mishaps. You can also check for gas leaks before lighting the grill.

11. Normal Fires That Go Awry

Sometimes it's impossible to avoid. Fire is famously difficult to manage, even when we do everything right, adhere to all the guidelines, and use common sense. Of course, allowing fires to start in our houses is one of the most frequent reasons for house fires. This is typically not a problem if handled properly, but even a single wayward ember from an active flame might ignite something, like a carpet.

Never leave an interior fireplace alone and practice caution in its vicinity. A log could crack at this moment in such a way as to send embers soaring.[17]

12. Faulty Electrical Equipment

Electrical problems are without a doubt one of the most frequent reasons for workplace fires.

They frequently result from faulty wiring, overloaded sockets or plugs, and outdated, broken equipment that becomes overloaded and sparks, igniting combustible materials.

It's crucial to remember that it is legally required for a workplace to guarantee that all equipment operates and performs as intended, and this includes electrical equipment.

A Portable Appliance Test (PAT) must be performed annually on all electrical equipment in a workplace to make sure it is safe and operating as intended.

All things that pass the PAT test have a sticker on them that lists the date of the test and the result.

13. Equipment Clutter

Office clutter is a typical problem, and if regular cleaning and maintenance are not done, it will eventually raise the risk of a fire starting. The office is filled of flammable items and other potential fire starters. Keeping workspaces in top condition and maintaining a regular cleaning

schedule are essential for lowering fire hazards. The chance of a fire starting will be significantly reduced by actively pushing staff to keep their workspaces as neat and orderly as possible.

14. Combustible Materials

It goes without saying that safety must come first for both employees and the management of such materials if your workplace stores or employs flammable or dangerous products.

If a business is known to use combustible materials, then proper storage, disposal, and handling procedures need to be strictly regulated, and worker safety must come first.

The handling of combustible and flammable materials requires ongoing education and training.

15. Human Error

Basic human mistake is a primary contributor to workplace fires. This is as a result of unintentional occurrences. Burning food in a staff area, spilling flammable liquids, using machinery or equipment improperly and causing it to overheat, and just plain negligence are a few examples of what can go wrong.

Making sure there are lots of appropriate fire extinguishers placed all over the work area is one way to stop these kinds of events from getting worse.

Additionally, it's critical that every employee receives adequate instruction on how to use a fire extinguisher and that they frequently review and evaluate any potential workplace risks that could arise from human mistake.

16. Negligence

Sadly, there are several potential for fires to start at work as a result of carelessness and incompetence. Shortcuts have been known to be used by some employees in an effort to complete a task more quickly; nevertheless, doing so could put a significant risk to health and safety and fire safety in danger.

Examples include obstructing ventilation spaces, piling paper or cards in combustible places, abusing or storing flammable or combustible items, and improperly operating or overusing equipment.

Regular reviews, retraining, and assessments should be conducted by business owners to ensure quality workmanship and lower the danger of future fires.

Nearly anywhere can catch on fire, although there are some settings where it is a particular danger. These situations include:

- Places of employment that use heavy machinery or industrial equipment. Heavy machinery and industrial equipment both rely on complex electronics to operate, and any

electrical issue can result in a spark or even a flame. In order to prevent this, employers must maintain their equipment.

- Factories that create dust as a byproduct in some form. If there is no active dust removal system in place, facilities that work with wood, paper, or other materials that can produce dust are constantly at risk of a fire accident. In the presence of an open flame, suspended dust, regardless of its composition, can cause an explosive inferno that almost always causes catastrophic injuries.
 - Places of employment that use heavy machinery or industrial equipment. Heavy machinery and industrial equipment both rely on complex electronics to operate, and any electrical issue can result in a spark or even a flame. In order to prevent this, employers must maintain their equipment.
4. Factories that create dust as a byproduct in some form. If there is no active dust removal system in place, facilities that work with wood, paper, or other materials that can produce dust are constantly at risk of a fire accident. In the presence of an open flame, suspended dust, regardless of its composition, can cause an explosive inferno that almost always causes catastrophic injuries. Products with flaws that is either combustible or constructed with subpar electronics. Before they are placed on store shelves, clothing and appliances in particular must undergo extensive testing. In fact, safety tests must be performed on every object that is anticipated to be used in close proximity to a flame. However, inferior clothing materials may be highly combustible, while faulty appliance wiring can produce sparks and feed a fire. The makers will be responsible in both situations. Auto accidents, particularly when gasoline or other hazardous liquids are spilled. If a fuel tank ruptures or if a truck transporting hazardous commodities is involved in the incident, a flame may ignite quickly, causing unpredictable casualties and effects.[17]

5. What Is Meant by Fire Safety?

The term "fire safety" refers to the rules and procedures designed to reduce the damage that fire can do. The goal of fire safety measures is to avert fire incidents from happening and to contain the fire once it starts to lessen the damage.

Concerns about Fire Safety in India

- States don't all have the same fire safety laws in place.
- India's fire safety standards are not properly enforced.
- The majority of fire departments in India lack sufficient organizational structure, current equipment, infrastructure, financing for cutting-edge firefighting technologies, and training chances for staff.
- In India, there is a lack of public understanding of fire safety.
- Numerous residential and commercial structures violate fire safety regulations.
- The various buildings' installed fire prevention systems are not properly maintained.
- There are no explicit guidelines for building fire safety audits.

There is no doubting the need to improve fire safety in India. To guarantee that fire safety regulations are strictly followed and adhered to, all parties involved, including the authorities, civic organizations, and the general public, are accountable.

Main Causes of Fire Accidents in India

The following are a few of India's primary fire accident causes:

- Electrical shunt.
- A gas cylinder or stove bursting.
- Human negligence.
- Improper handling and storage of flammable materials.
- Disregarding Indian fire safety regulations.[16]

6. Description of IOT Based Fire Department Alerting System Project

In industries, shops, malls, residential complexes, and parking lots, fire detectors are crucial. They can help save lives by assisting in the early detection of fire or smoke. Commercial fire detection systems typically use a buzzer or siren to signal an alarm. We have created a temperature and smoke sensor-based IOT-based fire alerting system. This project will use IOT to communicate relevant information in addition to signalling the presence of fire in a specific building.

With the aid of sensors, electronics, software, and connection, physical objects can share data through the Internet of Things (IoT), which is essentially a network of "things." There is no need for human involvement with these systems.

In this Arduino fire alarm system using temperature and smoke sensors using the IOT project, we can send LIVE information like Temperature, Smoke Value detected by a particular device to the Fire Department.

A detailed description of the IOT based Fire Alerting System Project

Temperature and smoke sensors are used in the IOT-based fire alerting system. The analogue signals received at the sensor end are converted to digital using an internal ADC converter in the Arduino. When the temperature and the smoke both reach a predetermined level, the Arduino is programmed to activate the buzzer.

Arduino simultaneously transmits the data to the ESP8266 Wi-Fi module. A chip called ESP8266 is used to link microcontrollers to Wi-Fi networks. The following information will then be sent by the ESP8266 to the IOT website so that authorised individuals can take the necessary actions to put out the fire.

1. Thermostat (in Degree Celsius) Smoke Value
2. (in Percentage)
- Device ID 3.
4. Time and Date Stamp

The device ID is a special ID assigned to a device that can be used to obtain information about the location where a fire has been detected.

The Wi-Fi module needs to be connected to a Wi-Fi zone or a hotspot in order for this Internet of Things (IoT)-based fire alarming system to function. Additionally, this project is carried out without the IOT module. The GSM module, which triggers an SMS when the buzzer is turned ON, has been utilised in place of the IOT module.

7. Technical Specifications

The following components are used in the project's IOT-based fire alerting system with temperature and smoke sensors:

1. smoke detector
2. A thermometer
3. Arduino, a microcontroller.
4. LCD Screen
5. ESP8266

6. Buzzer

6.1. How IoT is Changing Fire Safety

Driverless automobiles and household appliances are two of the Internet of Things' (IoT) most well-known uses. However, its most intriguing use in the field of fire safety may be in building sensors. The gathering and use of atmospheric data has the potential to significantly change how we approach putting out fires and saving lives.

6.2. IoT Sensors

IoT sensors are a key component of so-called "smart buildings." Smart buildings are structures that are partially managed by self-contained computer programmes called Building Management Systems (BMS). These sensors can control lighting, keep a certain temperature in various rooms, and perform other functions that benefit from outside information.

The same rules that govern fire safety also apply to fighting flames, which opens up a wide range of possibilities for brand-new approaches. Currently, temperature sensors are only able to detect temperatures within normal limits, although fire temperatures can be detected by special heatproof sensors. In addition to detecting fires before they produce smoke, this could also provide firefighters with information about the intensity of fires, allowing them to adjust their tools and strategy. Another priceless piece of information is the location of the fire in a building. You may currently be aware of the locations where detectors went off or an alarm was pulled, and you may also have access to witness evidence. IoT sensors can prove this beyond a shadow of a doubt by displaying not only the location of a fire's origin but also its rate of spread. Firefighting workers can receive all of this data automatically.

8. Fire Detection Systems

IoT technologies can help maintain crucial fire detection systems better. The fire alarm systems in many large buildings are a patchwork of several alarms from various manufacturers, with manual storage and maintenance procedures depending on the readings from each control panel. IoT can combine data from numerous alarm systems into a single point of contact (such a phone or computer interface), enabling a user to examine maintenance logs and data rapidly.

A smart IoT enabled fire system can deploy various measures to specific rooms, limiting damage to the larger facility, by sensing the exact location of the fire, the type of fire, and whether there are any occupants in the room.

Ensure Safety

New and intelligent systems can integrate information from almost every make of fire alarm systems via the internet, so it can be viewed on mobiles, laptops or tablets from anywhere in the world. This data can also be used for compliance purposes and prove that whoever is responsible has done everything they can to ensure a building is safe.

9. IoT Applications in the Fire Safety

[22]By gaining more value from a product that is required in the majority of homes and buildings, the fire sprinkler, IoT might revolutionise the fire safety sector. With additional sensors, smart sprinklers become smart safety systems that reduce hazards, help with insurance claims, and safeguard people and their property. Since the creation of the first usable sprinkler by Frederick Grinnell in 1882, the automatic fire sprinkler has essentially stayed constant. He created the glass disc sprinkler in 1890, which is essentially the kind that is still in use today. However, the fire industry's conservative mentality, which is understandable given the dire implications of failure, has contributed to the dearth of innovation in fire sprinkler design since its conception.

The New Fire Sprinkler



The installation of automated fire sprinklers in new residential construction is becoming a requirement in many parts of the world. Unquestionably, fire sprinkler systems can save lives, but according to several studies, their efficiency might range from about 70% to 93 percent. Despite being an admirable figure, there is still much space for improvement when compared to another type of life safety equipment, like an airbag, which has a 99.9 percent efficiency rate.

However, sprinkler success rates drastically decline in homes, where they fail 1 in 10 times. This is largely because sprinklers are disregarded and made to blend in and be forgotten. The system being turned off is the primary cause of 64% of failures, with lack of maintenance coming in second.

It can be challenging to address problems with home sprinkler systems, such as poor maintenance and leaks, particularly in a sector where adopting new ideas is culturally frowned upon. Change is conceivable, though; understanding how the insurance sector underwent structural change can give context for how comparable change will occur in the fire safety sector.

Fire Safety IoT Applications

A small number of fire industry businesses have already started designing their products to be IoT ready in an effort to solve the issue of neglect that leads to traditional sprinkler failures.

We can advance the fire sprinkler's functioning by creating a more clever approach that isn't only used in emergency situations. Future sprinklers might include features that appeal to homeowners and provide benefits and services outside of an emergency, which would complement device maintenance. Sprinkler systems will also receive additional sensors to transform them into home safety systems. These sprinklers may immediately offer a smart safety system for homes and buildings once they are connected to the cloud.



Image Credit: Plumis Ltd

Smart sprinklers can also assist with the cleanup after a fire; some businesses are adopting cutting-edge sprinkler systems to communicate with the insurance sector. These sprinklers have the capability of reporting fire-related behaviour that is then recorded in a "black box," giving the opportunity to assess the extent and origin of the damage while also considering potential future preventive measures. All parties can file insurance claims more quickly and affordably as a result. By analysing the number of "near calls" involving the activation of the suppression system, technology of this kind might also assess relative customer risk and propensity to have a fire.

The fire sprinkler is particularly intriguing because, unlike other smart home gadgets that rely on consumer buy-in, it is a one-time, sunk expense in many homes. In many places, you must have a fire sprinkler to comply with building codes, and 2999 out of 3000 households that don't experience a serious fire each year receive little benefit from their sprinkler systems other than peace of mind. Although there is more value to be had from sprinklers with the advent of fire safety IoT applications, fires are still more common in higher risk demographics and building categories. [22]

9.1. Fire Technology in Smart Cities and Beyond: How IoT Helps Fight Fires

[18]The First Responder Network Authority (FirstNet) public safety broadband network and other recent improvements in safety technology, such as Next Generation 911, are helping first responders.

Another technological advancement that is having an impact on a crucial aspect of public safety is the Internet of Things: firefighting. Fire departments gain many advantages from IoT solutions, which are supported by evolving fire technology.

IoT sensors and devices can improve building monitoring in smart cities to detect fires more quickly, give incident command centres more information, improve computer-aided dispatch, improve situational awareness for firefighters once they arrive at the scene of a fire, and aid in fire suppression through the use of smart sprinklers.

"Rapid access to information is crucial for first responders, including fire departments, emergency medical services, police departments, and others, who frequently find themselves in hazardous situations," "IoT solutions enable the intelligent networking of emergency vehicles, supplying first responders with precise and timely information about an emergency as they approach the scene, allowing them to cut down on response time and enable them to arrive ready to react swiftly to developing situations," says the company.

9.2. What Are Applications of IoT for Fire Departments?

IoT has a wide range of uses in the field of fire safety. According to Analytics Insight, wireless cellular networks or low-power wide area networks can send a variety of data from IoT sensors to help with fire prevention and response.

According to the article, IoT sensors can be integrated with "items such as alarms, personal safety gadgets, and fire suit technologies." Additionally, they can be used to track firefighters and provide incident commanders with more situational awareness and visibility into where specific firefighters are when they are putting out a fire. Radio-frequency identification trackers, which may be incorporated into firefighter gear, can provide real-time information on the whereabouts of firemen.

Additionally, information can be provided through wirelessly connected sensors to incident commanders and emergency command centres.

According to a blog post by BehrTech, a software firm that creates a wireless IoT connectivity platform, "Heat-proof sensors can indicate where the fire starts off, its strength, type, and spreading patterns, as well as whether there are any people in the fire zone." Real-time information about the situation on the ground allows for more efficient firefighting and evacuation efforts, which reduces damage and casualties.

According to a blog from ESO, a developer of electronic patient care software, the personal alert safety system gadget, which can detect firefighter motion, is another IoT application in firefighting.

According to the site, the apparatus also features a "acoustic transmitter that works as a beacon" to help locate the fireman when sensors notice they haven't moved for a predetermined amount of time.

According to ESO, such monitoring devices "may also contain sensors to measure oxygen and carbon dioxide partial pressure, volume flow rate, heart rate, gas pressure, body temperature, and exposure to hazardous auditory environments that may damage hearing" in the near future.

9.3. How IoT Supports Smart Building Fire Safety

IoT technologies can assist make buildings themselves smarter and safer in addition to safeguarding firemen and giving them additional information.

According to the BehrTech blog, "IoT sensors can be used to continuously monitor electrical systems and identify any active heat sources that are unseen to the naked eye." In order to prevent potential disasters, an alarm is promptly dispatched whenever a temperature spike is discovered. IoT temperature sensors are superior to conventional smoke detectors because they can identify lit fires even before they start to release smoke. The sooner an alarm is activated in an emergency when every second counts, the more the consequences can be reduced.

According to Analytics Insight, IoT sensors can also detect smoke or carbon monoxide in buildings, potentially turning off ignition sources. According to the website, "IoT enables a more targeted firefighting capability, effectively cutting off tiny flames." "Different procedures might be deployed for particular rooms using a smart IoT-enabled fire system to limit the damage."

9.4. Smart Sprinkler Systems Aid Firefighting

IoT sensors on smart sprinklers can simplify fire suppression in smart buildings.

A dry sprinkler valve can be made "smart" by adding several sensor components, claims the NFPA Journal, the periodical of the National Fire Protection Association.

The journal states that "two pressure sensors attached below the valve's gauges continuously collect data on air and water pressure." Cables link the sensors to an interface device that is attached to the valve's pipe and wirelessly transmits the data to a database where it can be used by facility managers, inspectors, and others to spot potential issues.

We may inform incident command that the fire should be under control if we know that 500 gallons of water per minute have been flowing on it for the past 30 minutes, according to Francis. One of our major "aha" moments as a company was the ability to externally monitor water flow in a sprinklered structure. We came to the conclusion that deploying firefighters inside would not be necessary. We are able to wait and enter the area later before using a fire hose for final extinguishment thanks to laboratory research and testing.

9.5. IoT's Role in Computer-Aided Dispatch

Additionally, IoT can be utilised to improve computer-assisted dispatch systems.

As an illustration, in 2018 AT&T and Rapid Deploy jointly announced a deal in which AT&T will grant PSAPs access to Rapid Deploy's cloud-based CAD platform.

The platform can be integrated with data-rich sources to enhance the situational awareness of a fire department or emergency operations centre. In a press release, it is stated that dispatchers "can access near real-time information, like closed-caption video streams or data from Internet of Things devices." They can improve their decision-making and gain a better understanding of the required response with the aid of these tools.

In a news statement, Northrop Grumman noted that the system gives PSAPs "access to enhanced location information and other data from smart devices such as phones, wearables, connected cars and houses, as well as popular apps for navigation and transportation services."

Firefighters may respond more effectively and safely if they have more knowledge. Imagine being a firefighter and getting computer-aided dispatch (CAD) data on your smartphone that includes the address, location of the fire, environmental conditions, location of people who are trapped, and video, according to the publication Firehouse. "Then, as firefighters arrive, incident command (IC) staff may monitor their location as they travel to that in need." [18].

10. Research Methodology:

Review literature as well as qualitative research methodology is used.

A literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. The review should enumerate, describe, summarize, objectively evaluate and clarify this previous research. It should give a theoretical base for the research and help you (the author) determine the nature of your research. The literature review acknowledges the work of previous researchers, and in so doing, assures the reader that your work has been well conceived. It is assumed that by mentioning a previous work in the field of study, that the author has read, evaluated, and assimilated that work into the work at hand.

Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

Qualitative research is the opposite of quantitative research, which involves collecting and analyzing numerical data for statistical analysis.

Qualitative research is commonly used in the humanities and social sciences, in subjects such as anthropology, sociology, education, health sciences, history, etc.

11. Paper Analysis:

Analysis of this research paper says that IOT (Internet of things) is a unique field which has many applications in many fields like defense, health, education etc. It has many applications in fire safety also as explained in this paper. It protects building from any fire accident as well as any miss happening. In this paper all applications related with fire safety of buildings explained.

In this paper IOT based fire alerting system is also explained. All equipments functioning during fire accidents are also explained. Role of IOT in fire safety is fully explained.

12. Conclusion

The fire sprinkler, which is a device that is a legal and/or insurance requirement in all buildings and houses, can be used by IoT to alter the fire safety business. The well-worn product first developed in the 1800s will have to adapt as a result of these changes, but maybe we'll come up with a better solution tailored to the demands and requirements of contemporary homes and people. As new products in the fire safety sector help reduce risks, assist with insurance claims, and carry out additional duties to safeguard people and their property, this gets more and more interesting.

References

1. Ahrens, M., 2019. Smoke alarms in US home fires. National Fire Protection Association.
2. Alarm (FDA) System with Building Automation”. IOP Conference Series: Materials Science and Engineering, 260, pp.012025, 2017.
3. Anwar, F., Boby, R., Rashid, M., Alam, M. and Shaikh, Z, “ Network-Based Real-time Integrated Fire Detection and
4. Asif, O., Hossain, M.B., Hasan, M., Rahman, M.T. and Chowdhury, M.E., 2014. Fire-detectors review and design of an automated, quick responsive fire-alarm system based on SMS. Int'l J. of Communications, Network and System Sciences, 7(09), pp.386.
5. Ayaz, M., Ammad-Uddin, M., Sharif, Z., Mansour, A. and Aggoune, E.H.M., 2019. Internet-of-Things (IoT)-based smart agriculture: Toward making the fields talk. IEEE Access, 7, pp.129551-129583.
6. Bayoumi, S., AlSobky, E., Almohsin, M., Altwaim, M., Alkaldi, M. and Alkahtani, M., 2013, December. A real-time fire detection and notification system based on computer vision. IEEE: International Conference on IT Convergence and Security (ICITCS),2013, pp. 1-4
7. Bu, F. and Gharajeh, M.S., 2019. Intelligent and vision-based fire detection systems: A survey. Image and Vision Computing, 91, p.103803.
8. Desima, M.A., Ramli, P., Ramdani, D.F. and Rahman, S., 2017, November. Alarm system to detect the location of IOT-based public vehicle accidents. IEEE: International Conference on Computing, Engineering, and Design (ICCED), 2017, pp. 1-5
9. Faraci, G., Raciti, A., Rizzo, S.A. and Schembra, G., 2020. Green wireless power transfer system for a drone fleet managed by reinforcement learning in smart industry. Applied Energy, 259, pp.114-204.
10. Fonollosa, J.; Solórzano, A.; Marco, S. Chemical Sensor Systems and Associated Algorithms for Fire Detection: A Review. Sensors 2018, 18, 553.

11. Gong, F., Li, C., Gong, W., Li, X., Yuan, X., Ma, Y. and Song, T., 2019. A real-time fire detection method from video with multifeatured fusion. Computational intelligence and neuroscience, 2019.
12. Gong, F., Li, C., Gong, W., Li, X., Yuan, X., Ma, Y. and Song, T., 2019. A real-time fire detection method from video with multifeature fusion. Computational intelligence and neuroscience, 2019.
13. Hamdan, O., Shanableh, H., Zaki, I., Al-Ali, A.R. and Shanableh, T., 2019, January. IoT-based interactive dual mode smart home automation. In 2019 IEEE International Conference on Consumer Electronics (ICCE) (pp. 1-2). IEEE.
14. Herutomo, A., Abdurrohman, M., Suwastika, N.A., Prabowo, S. and Wijutomo, C.W., 2015, May. Forest fire detection system reliability test using wireless sensor network and OpenMTC communication platform. In 2015 3rd International conference on information and communication technology (ICoICT) (pp. 87-91). IEEE.
15. Hsu, W.L., Jhuang, J.Y., Huang, C.S., Liang, C.K. and Shiau, Y.C., 2019. Application of Internet of Things in a Kitchen Fire Prevention System. Applied Sciences, 9(17), p.3520.
16. <https://byjusexamprep.com/current-affairs/fire-safety-in-india>
17. <https://safetymanagement.eku.edu/blog/10-most-common-causes-of-house-fires/>
18. <https://statetechmagazine.com/article/2020/08/fire-technology-smart-cities-and-beyond-how-iot-helps-fight-fires-perfcon>
19. https://www.cigionline.org/articles/emerging-internet-things/?utm_source=google_ads&utm_medium=grant&gclid=CjwKCAjw2rmWBhB4EiwAiJ0mtSFPAYwn-WqUZ1_cW_gKefsRjMOV07ifaC1d_vTQA3e-dWKd_lekURoCA0YQAvD_BwE
20. <https://www.geeksforgeeks.org/introduction-to-internet-of-things-iot-set-1/>
21. https://www.internetsociety.org/iot/?gclid=CjwKCAjw2rmWBhB4EiwAiJ0mtedCfhGrNefyS36PcSeWJEwIyhybK6IM-SawIwqJQLdlkq8qEWGE8RoCq04QAvD_BwE
22. <https://www.ietfforall.com/fire-safety-iot-applications>
23. [https://www.leverage.com/iot-ebook/what-is-iot#:~:text=%E2%80%9CThe%20Internet%20of%20Things%20\(IoT,%2Dto%2Dcomputer%20interaction.%E2%80%9D](https://www.leverage.com/iot-ebook/what-is-iot#:~:text=%E2%80%9CThe%20Internet%20of%20Things%20(IoT,%2Dto%2Dcomputer%20interaction.%E2%80%9D)
24. <https://www.terrybryant.com/personal-injury-lawyer/burn-injury-lawyer/what-are-common-causes-fire-accident>
25. IEEE: International Conference on ICT in Business Industry & Government (ICTBIG), 2016, pp. 1-6
26. Kanwal, K., Liaquat, A., Mughal, M., Abbasi, A.R. and Aamir, M., 2017, Towards development of a low cost early fire detection system using wireless sensor network and machine vision. Wireless Personal Communications, 95(2), pp.475-489. ISSN: 2088-8708 Int J Elec & Comp Eng, Vol. 9, No. 4, August 2020 : xx - xx 108.
27. Khalaf, O.I., Abdulsahib, G.M. and Zghair, N.A.K., 2019. IOT fire detection system using sensor with Arduino.

28. Kodur, V., Kumar, P. and Rafi, M.M., 2019. Fire hazard in buildings: review, assessment and strategies for improving fire safety. *PSU Research Review*.
29. Lee, D. and Kim, B., 2019. Study on Detecting Fires and Finding Rescuers. *Journal of the Korean Society of Hazard Mitigation*, 19(1), pp.225-230.
30. Liu, Z., 2003, “Review of Recent Developments in Fire Detection Technologies”. *Journal of Fire Protection Engineering*, 13(2), pp.129-151
31. Mahgoub, A., Tarrad, N., Elsherif, R., Al-Ali, A. and Ismail, L., IoT-based fire alarm system. *IEEE:Third World Conference on Smart Trends in Systems Security and Sustainability (WorldS4) July 2019*, (pp. 162-166). IEEE
32. Mahzan, N.N., Enzai, N.M., Zin, N.M. and Noh, K.S.S.K.M., 2018, Design of an Arduino-based home fire alarm system with GSM module. In *Journal of Physics: Conference Series (Vol. 1019, No. 1, p. 012079)*. IOP Publishing.
33. Moinuddin, K., Bruck, D. and Shi, L. “An experimental study on timely activation of smoke alarms and their effective.
34. Mowrer, F.” , 2010, Lag times associated with fire detection and suppression”. *Fire Technology*, 26(3), pp.244-265
35. Muneer, A. and Fati, S.M., 2019. Automated Health Monitoring System Using Advanced Technology. *Journal of Information Technology Research (JITR)*, 12(3), pp.104-132.
36. Muneer, A., Fati, S.M. and Fuddah, S., 2020. Smart health monitoring system using IoT based smart fitness mirror. *Telkomnika*, 18(1), pp.317-331.
37. Nfpa.org. NFPA - Data, Research, And Tools. [online] Available: <https://www.nfpa.org/News-and-Research/Data-research-and-tools> 2018.
38. Notification in typical residential buildings”. *Fire Safety Journal*, 93, pp.1-11, 2017.
39. Saeed, F., Paul, A., Karthigaikumar, P. and Nayyar, A., 2019. Convolutional neural network based early fire detection. *Multimedia Tools and Applications*, pp.1-17.
40. Saeed, F., Paul, A., Rehman, A., Hong, W.H. and Seo, H., 2018. IoT-based intelligent modeling of smart home environment for fire prevention and safety. *Journal of Sensor and Actuator Networks*, 7(1), p.11.
41. Salhi, L., Silverston, T., Yamazaki, T. and Miyoshi, T., 2019, January. Early Detection System for Gas Leakage and Fire in Smart Home Using Machine Learning. *IEEE: International Conference on Consumer Electronics (ICCE)* (pp. 1-6). IEEE.
42. Shah, R., Satam, P., Sayyed, M.A. and Salvi, P., 2019. Wireless Smoke Detector and Fire Alarm System. *International Research Journal of Engineering and Technology (IRJET)*.
43. Shokouhi, M., Nasiriani, K., Khankeh, H., Fallahzadeh, H. and Khorasani-Zavareh, D., 2019. Exploring barriers and challenges in protecting residential fire-related injuries: a qualitative study. *Journal of injury and violence research*, 11(1), p.81.

44. Silvani, X., Morandini, F. & Innocenti, E. , 2014, Evaluation of a Wireless Sensor Network with Low Cost and Low Energy Consumption for Fire Detection and Monitoring. *Fire Technology* (Springer, US). 3(12). p 51-4.
45. Sowah, R.A., Apeadu, K., Gatsi, F., Ampadu, K.O. and Mensah, B.S., 2020. Hardware Module Design and Software Implementation of Multisensor Fire Detection and Notification System Using Fuzzy Logic and Convolutional Neural Networks (CNNs). *Journal of Engineering*, 2020.
46. Suresh, S., Yuthika, S. and Vardhini, G.A., 2016, November. Home based fire monitoring and warning system.
47. Taha, I.A. and Marhoon, H.M., 2018. Implementation of controlled robot for fire detection and extinguish to closed areas based on Arduino. *Telkomnika*, 16(2), pp.654-664.
48. Tayyaba, S., Khan, S.A., Ashraf, M.W. and Balas, V.E., 2020. Home Automation Using IOT. In *Recent Trends and Advances in Artificial Intelligence and Internet of Things* (pp. 343-388). Springer, Cham.
49. Vishwakarma, S.K., Upadhyaya, P., Kumari, B. and Mishra, A.K., 2019, April. Smart energy efficient home automation system using iot. In *2019 4th international conference on internet of things: Smart innovation and usages (IoT-SIU)* (pp. 1-4). IEEE.
50. Willstrand, O., Karlsson, P. and Brandt, J., 2015. Fire detection & fire alarm systems in heavy duty vehicles: WP1–Survey of fire detection in vehicles.

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A CONCEPTUAL STUDY OF DESIGN THINKING: AN OVERVIEW IN PRESENT PERSPECTIVE

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Abstract

This conceptual study on design thinking provides an overview of design thinking issue in present perspective as an innovative problem-solving approach and as a business model to explain design and design thinking concepts from the researcher's point of view. The researchers have used descriptive research method to explain this popular concept and specially chosen this topic due to the increasingly? embraced by the world of business and business education over the last decade. The researcher has explained the design thinking as a human-centric problem-solving approach and as an iterative and a customer oriented approach and emphasized on the fact that how design thinking has captured the imagination of practitioners and educators in a range of fields in recent years and has been applied by many successful companies to attain competitive advantage. This paper mainly focuses on what is design thinking and how various researchers have defined designed thinking concept and related issues in their research papers. It has also covered a few related aspects like design thinking as an integrated approach.

Keywords: *design thinking, iterative process, wicked-problems, human-centred process, empathy, design thinking as an integrated approach.*

Introduction

Design thinking is an innovative problem-solving process rooted in a set of skills. The approach has been around for the decades, but it only started gaining attention outside of the

design community after the 2008 Harvard Business Review article entitled as "Design Thinking" by Tim Brown, CEO and president of design company IDEO. Design thinking is that is how designers think has long been a

topic of research and education in the field of design (Lawson, 1980; Rowe, 1987; Cross, 1990; Goldschmidt, 1994; Cross et al., 1996; Dorst, 2010), and more recently, outside this field too (Kelley, 2001). It is a phenomenon that involves observation, collaboration, fast learning, visualization of ideas, rapid prototyping, feedback gathering, and re-design. Design thinking is used to tackle “wicked problems” or ill-defined /unknown problems because they can reframe these in a very human centric ways and focus more on what is most important from the user’s perspective. It may also be considered as the best process for “thinking outside the box” and understanding the target user’s and their requirements, to add realistic contexts and insights to design processes. This is also termed as UX Research. The term design thinking has two current meanings. One is the study of the practices of working designers and the other meaning refers to the human-centred ‘open’ problem solving process which decision makers use to solve real world ‘wicked’ problems.” (Melles, 2010, p.299).

Design Thinking is a comprehensive customer-oriented approach

Design thinking involves innovation and creativity to generate and develop creative business ideas & entire business models. Essentially, Design Thinking attempts to explain the designers' thinking process, creativity, approaches, various design thinking models and methods applied into different business processes and activities. It supports and deals with a big or a small problem and provides all possible solutions to the wicked problems. These might be related to new products, services, business models or social and organizational concepts. Design thinking is applicable in a variety of professions, business, government, education, and in non-profit organizations. It is also applicable in sports, research and development to business, management and design. Design thinking is widely used by professionals around the globe. It is not only confined to a specific domain but it can be applicable in diversified areas like literature, art, music, science, engineering, business etc. Now majority of the organizations and industries have realised the significance of design

thinking applications. Multinational companies like Apple, google, Samsung, GE and many others are already applying design thinking concept in their products and services, processes, culture and making their products 'unique'. There is no doubt that design thinking is such an important part of majority of organizations and industries that they are rendering products and services by using design thinking models by getting more closer to the end users and taking their feedbacks. Design thinking is undeniably a powerful tool for various organizations and industries by which designers try to gain solutions to the wicked problems in a human centric manner. There is no doubt that design thinking is such an important part of majority of organizations and industries that they are rendering products and services by using design thinking models by getting more closer to the end users and taking their feedbacks

The design thinking is an iterative and a cyclical process

Though, the various phases of design thinking process include linear steps, but practically, the process is not

always linear as design thinking is iterative in nature and some of these steps may take place several times and the designer may even jump back and forth between them. Design thinking is an iterative process. It includes concept modelling, collaboration, prototype testing and interaction with users to receive their feedback. In academic plethora, the discussion about design thinking has been for more than 30 years, as it is an innovative method that has led to its popularity in various disciplines. As Goldschmidt (2017) stated, the term design thinking means different things to different communities. This distinguishes two facets: (1) Descriptive models of the design process, based on observational research of real-life or laboratory design activities by individuals or teams; (2) a method to be practiced in industries that strive to introduce innovative products or services. Design thinking helps in generating revolutionary solutions to the problems through innovation, creativity. In academic plethora the discussion about design thinking has been for more than 30 years, as it an innovation method that has led to its

popularity in various disciplines (Wrigley & Straker, 2017).

Design thinking involves five phases

The stepwise strategies used in design thinking are: (1) empathize: use a need assessment process to identify the problem and opportunities by observing, engaging, and empathizing with users; (2) define: frame the problem in a user-centric manner; (3) ideate: identify a broad range of ideas and potential solutions; (4) prototype: use an iterative process of testing & trial scaled down versions of solutions with users; and (5) test: implement and refine the chosen solution with user feedback. This last step includes the consideration of such issues as compatibility in a dynamically changing PESTEL environment of the dynamic market.

Objectives of the study

1. To study and give an overview on design thinking concept & related issues from the researcher's perspective.
2. To study and analyse the design thinking application in various areas and fields.

3. To study the design thinking significance in present context with the help of existing secondary data in the forms of existing journal articles, existing secondary data based materials.

Review Literature

To a large extent, the design and design thinking models and approaches in the business literature have been largely popularized by stories and case studies of work carried by design firms such as IDEO that have been working in new product development for decades. As per the interviews of design professionals conducted by Hassi & Laakso (2011), the roots of the term design thinking emerged in the late 1960s. The concept of design thinking is explicitly used by Lawson (1980) and was developed by Cross (1982) and Schön (1983). It became the title of a book by Rowe, published in 1987.

The term design thinking has two current meanings—the study of the practices of working designers—the other meaning refers to the human-centred 'open' problem solving process decision makers use to solve real

world 'wicked' problems." (Melles, 2010, p.299)

Brown & Wyatt (2010) explained design thinking as aimed at consumer insights in depth. Design thinking is inherently optimistic, constructive and experiential. Its concept is completely based on clients and customers' needs.

Design thinking is widely understood as a human-centered approach to creativity and innovation that includes inspiration, ideation and implementation that appears equally cyclical and iterative. Understanding people as inspiration, prototyping, building to think, using stories, and having an inspired and inspiring culture. Design thinking is a human based approach to invent and innovate something, design and implement something with the help of new methods and ways to develop innovative products, services, methods, business models and concepts and processes. It prevails in all aspects of business functioning of an organization. Design thinking comprises of a variety of creative strategies for managing and administering various kinds of projects with multiple stakeholders and

fostering organizational innovation. It deals with ambiguities and articulating the right questions, as well as identifying and formulating possibilities and potentials (Grots & Creuznacher, 2016, p. 191). It aims to address the immediate solution of the problem and is consisted of a few important steps to allow the designer to analyse, synthesize, diverge and generate insights from different domains through drawing, prototyping and storytelling. The design thinking is a phenomenon where the facilitator encourages learners to see constraints as inspiration. The results are typically directed toward a technological quick fix but toward new integrations of signs, things, actions, and environments (Buchanan, 1992).

Elsbach and Stigliani (2018) describe design thinking as an approach to problem solving that uses tools traditionally utilized by designers of commercial products, processes, and environments. According to Cochrane and Munn (2016) the three main elements of design thinking are observational research, visual sense making, and rapid prototyping. The authors describe a typical design thinking process as a cycle of (1)

empathizing and observing, (2) defining the problem, (3) creating ideas, (4) prototyping, and (5) testing (Cochrane & Munn, 2016).

Renard in 2014 proposed that the Design thinking has roots in various disciplines and is frequently, although not exclusively, associated with engineering, architecture and related design. The essence of design thinking is to put participants into contexts that make them think and work like an expert designer, and thereby foster civic literacy, empathy, cultural awareness and risk taking (Sharples et al., 2016).

According to Skaggs (2018) the tools observation, experience, and inquiry allow designers to understand human needs and shape information to drive the creation of products and experiences that make human connections through aesthetics, need-finding, or making meaning. Airbnb -In an article "How design thinking transformed Airbnb from a failing start up to a billion-dollar business."- outlines how the famed start up went from \$200 a week profit to the "unicorn" it is today. Design thinking is a part of Airbnb's success, in particular,

they built a culture of experimentation." It was only when they gave themselves permission to experiment with non-scalable changes to the business that they climbed out of what they called the through of sorrow?. Design thinking is considered halfway between analytical thinking and intuitive thinking. Analytical thinking involves purely deductive reasoning and inductive logical reasoning that utilize quantitative methodologies to come to conclusions. However, intuitive thinking refers to knowing something without any kind of reasoning.

Bross, Acar, Schilf, and Meinel (2009) describe design thinking as "a human-centred systems thinking approach that creates experiences for stakeholders by matching human factors with technological feasibility and business viability. The intuitive thinking helps in invention for the future endeavours, whereas analytical thinking is applicable to create something innovative and creative in the present, which is replicable. The willingness to use these futuristic solutions is what is called abductive logic. Design thinking helps design thinkers to develop deep empathy for

their customers and to create solutions that match their needs exactly. The solutions are not delivered just for the sake of technology.

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home toilets, there are few good options when it comes to our bodies most basic functions. Working with Unilever, water & sanitation for the urban poor (WSUP), and IDEO.org developed Clean Team, a comprehensive sanitation system that delivers and maintains toilets in the homes of subscribers. Clean Team now serves 5,000 people in Kumasi, Ghana, making lives cleaner, healthier and more dignified.

Taheri, Unterholzer, Hölzle, and Meinel (2016) stated that, “disparities among experts regarding the general understanding of design thinking, let alone its expected learning outcomes”. Several authors have observed that, despite its popularity, the concept lacks coherent and consistent descriptions (Kimbell, 2011; Taheri et al., 2016; Micheli et al., 2018). The design thinking approach is applicable to all kinds of business ideas – whether they have a product or service character. The first mouse for the Macintosh computer was created after a similar approach, or the first toothbrush with a wider ergonomic shaft. Design thinking involves five phases-Empathize, Define, Ideate, Prototype and Test. Organizations and

industries in 21st century find design thinking as a very valuable and significant means to problem solution for the users of their products and services.

Design thinking aims to address the immediate solution of the problem. The design thinking process consists of few important steps to allow the designer to analyse, synthesize, diverge and generate insights from different domains through drawing, prototyping and storytelling (Brown, 2009).

Renard in 2014 proposed that the Design thinking has its roots in various disciplines and is frequently, although not exclusively, associated with engineering, architecture and related design disciplines in early literature focused on design thinking. The essence of design thinking is to put participants into contexts that make them think and work like an expert designer, and thereby foster civic literacy, empathy, cultural awareness and risk taking (Sharples et al., 2016). IT industry comes up with a lot of products and services that require trials and testing of concepts and for this purpose the industry needs to

empathize with customers and clients along with deploying technologies. Design thinking has been recognized repeatedly for its contributions to business and management practices. This has led to an increase in the number of higher education programs that teach design thinking to business students, managers and executives (Matthews & Wrigley, 2017). In order to be marketable and competitive, students need to understand, embrace and generate innovation by developing and implementing new and meaningful ideas (Wright & West, 2010). Moreover, even the design discipline recognizes that the procedural knowledge of design thinking might be more important than the actual design skills – “the survival of design as a profession may depend less on traditional design education and more on responding strategically to contemporary changes, influenced by ethical and environmental issues as well as technological advancements” (Cassim, 2013). Many large successful international firms such as General Electric, Proctor & Gamble, Sony, and Philips, IBM use design and design thinking approach as a problem-solving apparatus across the company.

While the importance of design in business has been well established, the contributions of design were best known and valued in innovation and creativity in developing new products and new service development (Utterback et al., 2006). More recently, design thinking has moved from product and process design to becoming a key element in company strategy (Camillus, 2008; Fleetwood, 2005; Verganti, 2006, 2008).

Thus design and design thinking approach and models are not only used for developing products and services with new innovative and creative ideas but also coming up with more modifications in existing products and services. The drivers that have largely stimulated interest in design and design thinking at a company level are, the growing recognition of the potential impact of design and its contribution to successful business practice and the popularity of the notion of design thinking at the business level.

Research methodology

This research paper is basically descriptive and analytical in nature. In

this paper, an attempt has been made by the researcher to describe the concept of design thinking in detail and describing its application in various industries as design thinking is a problem solving approach, iterative and customer oriented in nature and tries to solve the “wicked problems” through customers feedback. The data collection is done on the basis of secondary sources such as research papers, articles and existing study material on design thinking according to the need of the study.

Design Thinking is an integrative approach

This means that the problem solving is considered together with its framework conditions. The problem analysis and solution development are considered systematically and holistically in the form of a process. The working environment for this process is designed to promote innovative ideas and creativity. One also speaks here of the three Ps of Design Thinking i.e. People (the human being), Process (the problem-solving process) and Place (the working spaces) must be considered for a successful idea development. The

fourth P can be Partnerships, since a large number of partners must be involved in the development and implementation of ideas. Design Thinking starts with people (human centric approach) and not with a technology or a business goal. The analysts, consultants, developers and managers have to brainstorm on possible ideas for clients problem solutions. This is where design thinking helps a lot in present prevailing situations. Design thinking has been recognized repeatedly for its contributions to business and management practices. This has led to an increase in the number of higher education programs that teach design thinking to business students, managers and executives (Matthews & Wrigley, 2017). In order to be marketable and competitive, students need to understand, embrace and generate innovation by developing and implementing new and meaningful ideas (Wright & West, 2010). Moreover, even the design discipline recognizes that the procedural knowledge of design thinking might be more important than the actual design skills – “the survival of design as a profession may depend less on

traditional design education and more on responding strategically to contemporary changes, influenced by ethical and environmental issues as well as technological advancements” (Cassim, 2013). The systematic review of the literature has revealed that Design Thinking is applied now a days in every sphere to find out innovative solutions. This is because the human orientation of Design Thinking provides at least two benefits. On the one hand, it provides solutions focused on the users’ experiences. On the other hand, it provides a good working environment for finding out creative solutions. Both aspects are the main goals of any modern profession. Designers from various areas use the design thinking model because of its simplicity and its flexibility, it has become established as a standard in the field. So, there is a vast scope for the researchers and designers to introduce more methods, techniques to be applied to find out solutions.

Discussion & Conclusion

The main issues can be summarized as many large successful international firms such as General Electric, Proctor & Gamble, Sony, and Philips, IBM use

design and design thinking approach as a problem-solving apparatus across the company. While the importance of design in business has been very well established, the contributions of design were best known and valued in innovation and creativity in developing new products and new service development (Utterback et al., 2006). More recently, design thinking has moved from product and process design to becoming a key element in company strategy (Camillus, 2008; Fleetwood, 2005; Verganti, 2006, 2008). Thus design and design thinking approach and models are not only used for developing products and services with new innovative and creative ideas but also coming up with more modifications in existing products and services. The drivers that have largely stimulated interest in design and design thinking at a company level are, the growing recognition of the potential impact of design and its contribution to successful business practice and the popularity of the notion of design thinking at the business level. Design thinking supports and deals with a big or a small problem and provides all

possible solutions to the wicked problems. These might be related to new products, services, business models or social and organizational concepts. Design thinking is applicable in a variety of professions, business, government, education, and in non-profit organizations. It is also applicable in sports, research and development to business, management and design. It is widely used by professionals around the globe. It is not only confined to a specific domain but it can be applicable in diversified areas like literature, art, music, science, engineering, business etc. Thus design and design thinking approach and models can be mainly used for developing products and services with new innovative and creative ideas and also coming up with more modifications in existing products and services. The drivers that have largely stimulated interest in design and design thinking at a company level are, the growing recognition of the potential impact of design and its contribution to successful business practice and the popularity of the notion of design thinking at the business level.

Recommendation

Design thinking is a process and a mindset. Nowadays, modern society is facing huge techno-economic and social changes leading to new forms of competitions and various challenges in all kinds of organizations and industries. And design thinking is the only appropriate solution for all kinds of challenges and problems faced by business organizations. So, there is a great need to implement and execute new design thinking teaching methodologies, directed toward developing students with a new set of skill-sets necessary for excellent performance in this new paradigm. These new design thinking skill-sets include creativity, teamwork, critical thinking, and the ability to face complex problems and analyse all those wicked problems from the customers perspective and based on the analysis and discussion with the customers giving viable solutions to various industries by expert designers. Design thinking supports and deals with all kinds of “wicked-problems” either big or small and provides all possible solutions by the design experts or designers related to new products, services, processes,

strategies business models or social and organizational concepts. As design thinking is applicable in a variety of professions like business, government, education, and in non-profit organizations, sports, research & development so there is an urgent need to know and explore new facts and figures about design thinking by the research scholars. Design thinking is the need of the hour to get success as designer experts identify and address the main problematic causes that plague the whole business process and affect customers too as well. Design thinking being a customer-centred process based on customer's feedback, helps producing customer friendly, desirable products and services at a

very economic price so now majority of the organizations and industries have realised the significance of design thinking applications. One stands out for its resounding success among all, known as Design Thinking. Design thinking via applying its various phases and observing and empathizing with people by listening their issues tries to gain innovative solutions to the problems. There is an urgent need to create more and more design thinkers according to the demand in various industries and the dynamic market so there is an urgent need to introduce design thinking as a subject in majority of the universities, colleges and institutions.

References

Altschuler, Genrich Saulowitsch (1994). *And Suddenly the Inventor Appeared: TRIZ, the Theory of Inventive Problem Solving*, Technical Innovation Center, Worcester, USA.

Alvarez, Cindy. (2014). *Lean Customer Development: Building Products Your Customers Will Buy*, O'Reilly, Sebastopol, USA.

Alhamdani W. A. (2016). Teaching cryptography using design thinking approach. *J Appl Secur Res* 11(1), 78–89. Available at: <https://doi.org/10.1080/19361610.2015.1069646>.

Behm M, Culvenor J, Dixon G. (2014). Development of safe design thinking among engineering students. *Safety Sci* 63, 1–7.

- Available at: <https://doi.org/10.1016/j.ssci.2013.10.018>.
- Brown, T. (2008). Design thinking. *Harvard Bus Rev* 86, 84–92. Available at: <https://hbr.org/2008/06/design-thinking>.
- Greenhalgh, S. (2016). The effects of 3D printing in design thinking and design education. *J Eng Des Technol* 14(4), 52–769. Available at: <https://doi.org/10.1108/jedt-02-2014-0005>
- Johansson-Sköldberg U, Woodilla J, Çetinkaya, M. (2013). Design thinking: past, present and possible futures. *Creativity Innovat Manag* 22(2), 121–146. Available at: <https://doi.org/10.1111/caim.12023>
- Mentzer, N, Becker K, Sutton, M. (2015). Engineering design thinking: high school students' performance and knowledge. *J Eng Educ* 104(4), 417–432. Available at: <https://doi.org/10.1002/jee.20105>
- Mubin, O, Novoa M, Al Mahmud A (2017). Infusing technology driven design thinking in industrial design education: a case study. *Interact Technol Smart Educ* 14(3), 216–229. Available at: <https://doi.org/10.1108/itse-01-2017-00088>.
- Brown, Tim. (2009). *Change by Design – How Design Thinking Transforms Organizations and Inspires Innovation*, Harper Collins, New York, USA.
- Brügger, Chris., Hartschen, Michael., Scherer, Jiri. (2017). *Simplicity: Starke Strategien für einfache Produkte, Dienstleistungen und Prozesse*, 2nd edition, Gabal-Verlag, Offenbach.
- De Bono, Edward. (1972). *PO: A Device for Successful Thinking*, Simon & Schuster, New York/USA.
- De Bono, Edward. (2016). *Six Thinking Hats*, Penguin Books, London/UK.
- Stickdorn, M, Schneider, J. (2010). *This is Service Design Thinking*. BIS Publishers. Amsterdam, 2010.
- Tim Brown. (2009). *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation Introduction*, 2009.

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ROLE OF DIGITAL TRANSFORMATION IN SUSTAINABLE BUSINESS PRACTICES

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ABSTRACT

Pandemic COVID-19 has accelerated the emergence & adoption of digital technology & digital transformation in all spheres of life. Techceleration is in full swing and organizations adopted new digital platforms and applications, automated and updated workflows. Technology is transforming leaps and bounds and so is the business of technology. Sustainability has always been the most universal concern for business organizations. The unification of digitalization and business practices posed a great challenge for everyone and the sustainability of all business practices. The Digital Masters like Nike and Asian paints are successful in terms of innovation, creativity, design, customer engagement & managing their internal operations. This paper has highlighted on two very important aspects of digital masters i.e., the digital capabilities & the leadership capabilities. The digital transformation has become significant for every organization to keep up with the competition & survive with agility and competency by combining technology, business and human capabilities. This paper shall be highlighting on the concept of Digital Master and its constituents like Digital capabilities and Leadership capabilities & few related sustainability issues. Data collection is based on primary & secondary data sources. The primary data has been collected from observation methods and interview techniques.

Keywords: Digital transformation, Digitization, Technology, Digital Master, Digital Capabilities, Leadership Capabilities, Industry 4.0

I. Introduction

1. Digital transformation in Industry 4.0 era

In last two decades, the world has seen an unprecedented growth in information and communication technologies along with many challenges like uncertainty, keeping up with the market, using the right systems, changing patterns of skills and attitudes and changes in the market scenario. Digitalization, availability of right human capabilities and automation are game changers to meet these challenges on the way to Industry 4.0. Industry 4.0. is also referred as 4th industrial revolution and is characterized by the digitalization and integration of industrial manufacturing and logistics processes, the use of internet and smart objects i.e. machines and products and combining physical and the virtual worlds by the adoption of information and communications technology (ICT) leading to shorter operational cycle times and prompt delivery systems, marketing of new products and services, improved quality of product & service customization, customer involvement and customer loyalty. Industry 4.0 helps industries to introduce new emerging markets by coming up with unique and differentiation strategy or a new disruptive business model. One of the important elements of digital transformation is exercising strong leadership, the right human competency and digital capabilities leading to multiple job opportunities and improvement in job creation along with the required skill enhancement. There will also be considerable job losses for Employees with low skill levels. Now a days companies need to adopt more transparent and responsible approaches for the holistic development of economic growth, manpower skill-enhancement, social progress, equity, respect, and awareness of the environment (Fonseca, et al., 2016). Industry

4.0 creates higher value-added chains and changes the classical human and production organization systems, the organizational business models, impacting the overall society and the environment (ACATECH, 2013). The use of advanced analytics will improve predictive maintenance, avoid equipment failures and downtime. Human workers can be used for tasks where they are essential, such as innovation, creativity and product improvement and quality assurance. The available data can be used to create and deliver 'smart' products. Employees with low skill levels risk becoming replaceable unless they are retrained, but those with the right competencies such as creativity, decision-making skills, and technical and ICT expertise will have more autonomy and interesting work. New Business Models and envisioned potential benefits of Industry 4.0 The organizations that adopt the industry 4.0 can expect to significantly improve their present competitive position, increasing value creation and minimizing risks. The adoption of more efficient and faster production systems and of innovative technologies will allow shorter operations, delivery times and faster time to market of new products and services.

Companies by effective execution and implementation of industry 4.0 and digital transformation, significantly improve their competitive position, increase value-creation and minimize risks, with the adoption of more efficient & faster production systems and innovative technologies. Amongst the main envisaged benefits are shorter operations cycle times, quick delivery times, faster pace to market new products and services.

1.2 Pandemic COVID-19 & digital transformation

Digital transformation is more apparent since 2020, when the COVID -19 Pandemic took hold of the world. Organizations were having a great challenge of survival during that time due to the lockdown imposition all over the world. Pandemic COVID -19 has changed the face of human interactions and posed a serious threat on sustainability of the organizations. The biggest challenge in industry 4.0 and digitalized era is the sustainability of business organizations in terms of sustainable transformation, balancing the need to keep business in motion, creating new business opportunities and a better future for the people. Technology emerged as a key driver to ensure business continuity. Organizations implemented and executed new digital platforms, automated and updated workflows. COVID-19 brought a shock-transition and that's the world we live in and work now. Organizations looked up to up-skill, re-skill and digitally skill their employees from top to bottom with more resiliency to deal with the pace and uncertainty of market developments to characterize market realities, market volatility & conditions continue to be unpredictable. Supply chain disruption is ongoing. Organizations need to be the 'Digital Masters' to drive significantly higher level of profits, productivity and to better perform. Organizations need to deploy various digital platforms using automation and analytics for more employee engagements, and efficiencies. Organizations need to focus on external and internal customers' needs and alignment of people, businesses, infrastructure, processes, strategies to achieve organizational as well as individual goals for organization's sustainable development. There is need to hire and set-up a multi-disciplined team to solve various organization's problems with sophisticated solutions and multi-faceted situations. It requires more reliance on the part of human capital and human inputs. Nike and Asian Paints represent excellence in two important dimensions i.e., digital dimensions and leadership dimensions as part of digital mastery. Digitalized Companies know where and how to invest, and their leaders remain continuously engrossed in guiding the company powerfully into the digital future and exploit all digital advantages to remain in superior competitive positions.

1.3 Digital capabilities & leadership capabilities

The two critical elements of digital mastery i.e., digital capabilities and leadership capabilities are associated with different type of performance. Digital master companies using digital technologies and leadership capabilities earn higher profits, productivity and performance but those are very rare and most of the firms fall short of digital mastery. If organizations really want to be digital masters, they will have to develop digital capabilities by setting up a clear vision and mission and work upon it. Because the real success comes when organizations focus on both the elements. Digital master companies excel build digital capabilities by rethinking and improving their business processes, engaging their customers by any means and bringing modifications in their business models and also building leadership capabilities to drive transformations. (George Westermann et al., " Digital Transformation: A roadmap for Billion Dollar Organizations," white paper .Capgemini Consulting and MIT Centre for Digital Business , Nov 17,2011, www.capgemini-consulting.com/digital-transformation-a-road-map-for-billion-dollar-organizations, 14-15). Digital masters outperform their peers. Amazon, Airbnb & Alibaba, Uber and many multi-national companies, through digital transformation maintain wide range of activities. WALMART, TARGET etc. switched to curb the side delivery with apps and automated messages letting people know when to pick up their products via digital means. Nespresso, Capital One Clarion Technologies, Hakuna Matata Solutions, Info Vision Labs, Rapid Acceleration Partners, Mphasis, Genpact, Kelton Tech, Cognizant are few

examples of digital transformation companies. With the rapid digitization due to COVID -19, Augmented Reality (AR) and Virtual Reality (VR) gained prominence. It is predicted that nearly 75% of the world's population would be routinely engaged with AR by 2025. Digital Master companies follow the strategy of harnessing the recent waves of innovations, creativity, communication technology and to continuously having a close watch on the dynamic market and its patterns. Digital Masters outperform their peers and competitors. Based on a survey it was found that digital masters are 26 % more profitable than their average industry competitor's and generate 9 % more revenue with their physical capacities and drive more efficiency. We now live in a big data world and digital master companies grow in two dimensions i.e., digital capabilities and leadership capabilities. Digital technology, AR and VR is now getting evolved in leading brands who are adopting technology and upgrading themselves. These companies use all these technologies to be closer to customers, employee empowerment and to transform their internal business processes. According to one report on digital mastery by Capgemini Research Institute "Digital Mastery – How organizations have progressed in their digital transformations processes over the past two years" digital masters are increasing the distance between themselves and their competitors and peers as in 2018, there was a 38-percentage point difference between digital masters and all other organizations. This gap rose to 48% in 2020. Over one-third (34%) of digital master's plan to increase their transformation spending in the next 12 months because of COVID-19, compared to 28% of all other organizations

1.4 An urgent need to develop human-centric skills and 'Augmentation of workforce'

There is no doubt that future of work is shifting and technology advances are continuously taking place so changing business and industry functioning pattern as well. Augmentation of workforce refers where humans and machines work alongside each other. Human-centric or soft skills are based on human qualities and the knowledge that is gathered often through shared social experiences and interactions with others and these skills can only be learnt by human. According to a 2020 study by LinkedIn learning the most demanded soft skills are creativity, collaboration, adaptability and emotional intelligence. Solving complex problems require creative and critical thinking, cognitive reflection and the ability to work as a team. In any situations where outcome is not known in advance it takes a skilled human to analyse and explore the right avenues of questioning to go on and solve a problem. As per the changes in dynamic market environment we need to be adaptable, changing and evolving ourselves helps us to adapt with those shifts specially evidenced since COVID -19 hit and many businesses moved to online and remote working ways. A successful way to take our learned technical and soft skills together and use them all at the same time is the right winning approach. EQ skill is most needed in present and future workforce. In last two decade we have seen an unprecedented growth in information and communication technologies. Digital technology brought lot of transparency in government policy framework also. Digital technology helps in creating high paying jobs and enforcing organizations re-skill and digitally skill their workforce, unlearn and re-learn, re-building systems, processes, strategies. People in organizations are to be skilled in technology, design thinking, analytics, story-telling, and artificial intelligence, robotics as per the need of the hour. People at grass-root level and working at lower profile are also required to be trained, competent and multi-skilled in a variety of technological areas.

1.5 Work from Home (WFH)

Though pandemic seems to be far away at the moment but still risks of occurrence is always there. Under all these crisis situations, organizations had no options except working from Home. As the COVID- 19 pandemic situations improved, hybrid working started functioning. For many companies working from home (WFH) has been the most significant innovation to come out of the pandemic. In 2020, pandemic covid -19 turned to be the best year for new innovative and creative ideas. Companies invested in many new technologies and also enabled their employee's leadership capabilities. A wide spread adoption of remote working during pandemic crisis led to further innovation in future. The companies discovered that working from home worked very well and people became more productive in terms of saving travel expenses, working from anywhere of the globe and could devote more time in work bringing positive and productive reports.

Though work from home is more challenging when it comes to time management and striking a balance between mental and physical wellbeing while performing household chores and workplace amicably and peacefully. One of the biggest advantages of work-from-home is the time saved in commuting both ways. Technological advancements support work from home in a significant way. From a macroeconomic perspective, lesser commuting means a There is an urgent need is to understand the true emotions of employees, their recognition

and wellbeing and growth and various kind of developments . In modern hectic lifestyle employee wants 4Cs i.e., convenience, comfort, commute-less and cost of living saving time, money and giving more attention on health and mental wellbeing. On the other hand, employers and managers wanted 4Cs like client's servicing, cybersecurity, collaboration and cubicles. Today Indian homes also has grown from an offline comfort zone to an automated smart home that can be monitored, controlled and scheduled. New technologies like Metaverse are revolutionizing the space as it is an extension of the real world into virtual reality. communication technologies.

1.6 Digital Masters: Gaining Digital advantage requires leadership

Digital Master firms are those firms who believe in top-down transformation. For these firms' technology is just an enabling tool. The real source of digital transformation is to bring changes in working processes and organizational culture. Digital master companies mainly focus on understanding customers behaviour and then using technologies to reach out to the customers. They use metrics and analytics to understand product usage to create personalized experience by harmonizing physical and digital experiences. Digital Master companies not only invest in technology but how these changes lead that makes these companies digital masters. Digital Master companies excel in two critical dimensions i.e. The what of technology (digital capabilities) and how of leading change (leadership capabilities). Each one of them play a very significant role. Digital transformation's goal is to use technology as a way to get more closer to customers and understanding their behaviour on a priority basis, employee empowerment and employee engagement and thus bring transformation in organizations processes and operations. It's very essential to identify the right business areas to invest to attain higher revenues Organizations and industries are required to re-think again by anticipating what future skills and talents are needed. Re-structured and re-defined work roles coupled with re-skilling of human resources is the need of the hour. It is important for companies to ensure that the workforce is rebooted by being smarter through virtual acclimatization and virtual relationship management. Committed leadership is a lever that turns technology into transformation. Regular manager and employee communication, provide space and virtual tools to allow employees to feel seen and heard. In addition to this, organizations are also investing in soft-skills development such as emotional intelligence, adaptability, and collaboration. Research shows that only 45% of organizations are accelerating sustainability investments, projects, and commitment and less than half of organizations (49%) are investing in emerging technologies (e.g., AI, blockchain) to tackle sustainability and climate change challenges

1.7 Discovery -Driven Digital transformation

This approach mainly looks deep into the problem and tries to solve & explore the various causes of the problem and giving rise to innovative solutions with the help of digital technology. Discovery driven planning (DDP). Digital transformation requires new ways of approaching strategy. A Discovery Driven approach exploits rich knowledge of the customers and tries to understand their preferences, broad operational scope, deep talent pools and a new business model. The DDP process translates that challenge into transparent and clear projects goals.

II.. Objective:

- To develop an understanding on digital transformation, digital technology and various discovery driven transformation approaches.
- To emphasize the urgent need to incorporate digitalization and digital transformation in various organizations considering technology as a key driver for sustainability of organizations and industries and building human capabilities.
- To discuss the concept of Digital Masters and its two important elements i.e. Digital capabilities and Leadership capabilities & its applications in various organization's activities.
- Embed purpose and sustainability as a core part of the business.

III.Research methodology

This paper aims to present and develop a deeper understanding on digital transformation and sustainable development in business organizations & other various aspects related to it as well as its application in various industries. This research paper is exploratory, descriptive and analytical in nature. Data collection is based on

primary and secondary data sources. Primary data has been collected from observation methods and interview techniques.

IV. Discussions and Analysis

Digital transformation especially post-covid helping to address all social, environmental, and economic challenges all across the globe. Successful companies should always have a clear-cut vision and they should work towards it by finding new opportunities to digitalize problematic processes and their core operations. New metrics to use and new business models to introduce and to innovate new strategies to outperform their competitors. Digital transformation is the process of using the digital technology to fix various problems of the organizations by exploiting the rich knowledge of the customers and utilizing the brain and potential of deep talent pools existing in the company. There was a boundary between traditional companies and markets but now digital transformation has changed everything by making it possible to use markets for lot of work that once was done within the firms. Alibaba and Amazon outsource many functions like selection of suppliers, negotiating prices, payments managements online via UPI and other ways. Digital transformations has also cut out intermediaries and helped businesses more profitable.

Demonetization announced in India in 2016 has shifted people from physical mode of banking operations to digital mode and today about 80% of people in India use digital/cashless banking processes. Digital technology is not only the digitalization of communications but an entire plethora of new processes and instruments. Maintenance of all the Governmental and personal records from physical form to digital mode have amounted to saving of tons of paper and other resources and saved the environment eloquently. In case of remote working, companies moved 10 times more quickly than they thought possible before the pandemic. Before then, respondents say it would have taken more than a year to implement the level of remote working that took place during the crisis. In actuality, it took an average of 11 days to implement a workable solution, and nearly all of the companies have stood up workable solutions within a few months. Organizations and industries are required to adapt to the dizzying pace of change in technology innovation and business model disruptions, rising expectations of markets, employees, and customers. The pace of technology innovation and digital disruption has only quickened, exacerbated by the COVID-19 pandemic forcing large organizations in all sectors to assess their digital transformation strategies. In last many years & specially during and post COVID-19, digital disruption took place at its maximum level and shopping trends of the consumes got completely changed from physical platform to online shopping activities. Libraries now are digital as compared to physical in the past Books in the past were in the physical form where students had to carry a heavy load of heavier books, but today people only subscribe to the online edition and get what they want from different sources. Now a days. Digital transformation has also taken place in banking systems. we do not need to visit our bank for anything, and by simply clicking of a mouse from our desktop computers, entire banking process could be handled as per our requirement and comfort. Mobile banking has further added to making the life simple and easy. Green banking, digital banking and carbon trading are the concepts of digital/information age. Today, people talk about ESG norms and standards where companies and businesses are being compelled to adhere to environmental, social and governance efficiency are the outcome of digitization of business operations.

Today, we hear of driverless cars, trains, pilotless planes, flying cars, robots etc. all are further going to revolutionize mechanical operations digitally and making human life more thrilling and fuller of adventures and joy. With the advent of internet on January 01, 1983, the digital developments have grown up leaps and bounds. Some studies observe, the main cause of growth of digitization is booming technology, constant development of internet, mobile applications and technologies based upon machine learning, artificial intelligence (AI).

So, business world has realized this fact very well that to remain relevant and competitive in the market digitization of every aspect of business is must. Digitalization of business started very early but its power was realized during pandemic era. As digitalization improved productivity, improved customer experience, increased resiliency, prompt decision making and competitive advantage and creates a win-win situation for all the parties: customers, employees and employers (Kaushik & Guleria, 2020). Digital Business Transformation (DBT) is a process of reinventing and reengineering business operations to capture the full potential of information technology across the supply chain management, communication, social networking, collaboration, content management, and access to analytics and also staff and customer satisfaction.

V. Recommendation

A wide spread adoption of remote working during pandemic crisis led to further innovation in future. The companies discovered that working from home worked very well and people became more productive in terms

of saving travel expenses, working from anywhere of the globe and could devote more time in work bringing positive and productive reports.

The digital transformation has become significant for every organization to keep up with the competition & survive with agility and competency by combining technology, business and human capabilities. So, organizations need to digitalize their processes, and bring forth modifications and transform digitally their organizations processes, strategies and emphasize on digital skilling.

1) In last two decades, the world has seen an unprecedented growth in information and communication technologies along with many challenges i.e. uncertainty, keeping up with the market, using the right systems, changing patterns of skills and attitudes and changes in the market scenario. Digitalization, availability of right human capabilities and automation are game changers to meet these challenges on the way to Industry 4.0 so digitalization and integration of industrial manufacturing and logistics processes is must. In digital transformation processes, the use of internet and smart objects i.e., machines and products and combining physical and the virtual worlds by the adoption of information and communications technology (ICT) is recommended leading to shorter operational cycle times and prompt delivery systems, marketing of new products and services, improved quality of product & service customization, customer involvement and customer loyalty.

2) digital transformation is must now a days for all sectors as it is exercising strong leadership, the right human competency and digital capabilities leading to multiple job opportunities and improvement in job creation along with the required skill enhancement. There will also be considerable job losses for Employees with low skill levels. Now a days companies need to adopt more transparent and responsible approaches for the holistic development of economic growth, manpower skill-enhancement, social progress, equity, respect, and awareness of the environment 6) The use of advanced analytics will improve predictive maintenance, avoid equipment failures and downtime. Human workers can be used for bringing innovative ideas, creativity and product improvement and quality assurance.

3) The available data can be used to create and deliver 'smart' products. Employees with low skill levels risk becoming replaceable unless they are retrained, but those with the right competencies such as creativity, decision-making skills, and technical and ICT expertise. Companies by effective execution and implementation of industry 4.0 and digital transformation, significantly improve their competitive position, increase value-creation and minimize risks, with the adoption of more efficient & faster production systems and innovative technologies. Amongst the main envisaged benefits are shorter operations cycle times, quick delivery times, faster pace to market new products and services.

4) Organizations need to up-skill, re-skill and digitally skill their employees from top to bottom with more resiliency to deal with the pace and uncertainty of market developments to characterize market realities, market volatility & conditions continue to be unpredictable. Organizations need to be the 'Digital Masters' to drive significantly higher level of profits, productivity and to better perform. Organizations need to deploy various digital platforms using automation and analytics for more employee engagements, and efficiencies.

5) If organizations really want to be digital masters, they will have to develop digital capabilities by setting up a clear vision and mission and work upon it. Because the real success comes when organizations focus on both the elements. Digital master companies excel build digital capabilities by rethinking and improving their business processes, engaging their customers by any means and bringing modifications in their business models and also building leadership capabilities to drive transformations. As per the changes in dynamic market environment we need to be adaptable, changing and evolving ourselves helps us to adapt with those shifts specially evidenced since COVID -19 hit and many businesses moved to online and remote working ways. A successful way to take our learned technical and soft skills together and use them all at the same time is the right winning approach. EQ skill is most needed in present and future workforce.

6) wide spread adoption of remote working during pandemic crisis leaded to further innovations in future. The companies discovered that working from home (WFH) and hybrid working worked very well and people became more productive in terms of saving travel expenses, working from anywhere of the globe and could devote more time in work bringing positive and productive reports.

VI. Conclusion

VII. Digital transformation helps in disseminating information to anyone and that can be used for many purposes enabling individuals and communities to fully exercise their rights and take the advantage of public programs. So, data and information as a source from digitalization related to all fields, administration, commerce, education, finance, health, tourism, and technology used in shaping our dreams helping us in making some useful decisions. A wide spread adoption of remote working during pandemic crisis led to further innovation in future. Digital transformation is now essential for business can survive and growth. Without effective digitization, no business can survive let alone thrive in the future. Digital transformation includes automation, artificial intelligence, and machine learning is the future so the companies those have adopted early technology shall reap the benefit of it in future. The companies discovered that working from home (WFH) and Hybrid working worked very well. DT is the field in which the academic literature is most interested, but it still requires a deeper definition of the concept, a better understanding of the requirements, but also a strategic orientation in the long run.

VIII. Acknowledgement & Declaration:

I acknowledge that this research paper has not been previously published and is not under consideration for publication elsewhere; and further, that if accepted, it will not be published elsewhere. I also acknowledge that no funding has been done for this research work. And no conflict of interest is there while submitting this paper has been found.

References:

- [1] Arribas, V., & José, A. (2018). 3D Technology in Fashion: from Concept to Consumer. *An International Journal*, 22(2), 240-251. doi: 10.1108/JFMM-10-2017-0114 .
- [2] Chen, B., Wan, J., Shu, L., Li, P., Mukherjee, M., & Yin, B. (2017). Smart Factory of Industry 4.0: Key Technologies, Application Case, and Challenges. *IEEE Access*, 6, 6505-6519. doi: 10.1109/ACCESS.2017.2783682.
- [3] *Digital Transformation* (2015), Vol.14, MIT Sloan management Review and Deloitte University press.
- [4] Kaushik, M. (2022). *Digital Transformation: Recent Trends and Practices*. India: Himalaya Publication.
- [5] HBR, "On Leading Digital Transformation".
- [6] https://en.wikipedia.org/wiki/Information_Age#cite_ref-1.
- [7] Olena K., Maryna L., Dariia M., Yuriy V., and Svitlana B. (2019) "The digitalization as a global trend and growth factor of the modern economy", *SHS Web of Conferences* 65, 07004.
- [8] <https://theecmconsultant.com/advantages-of-digitalization/> Accessed on April 29, 2022.
- [9] <https://turbofuture.com/misc/Disadvantages-of-Digital-Technology>, Accessed on April 30, 2022
- [10] Westermann, G., C. Calm Jane, D. bonnet, P. Ferraris and A. McAfee (2011), *Digital Transformation: A Roadmap for billion Dollar Organizations*, MIT Centre for Digital Business and CapgeminiConsulting, 1-68.
- [11] <https://www.researchgate.net/publication/342011150> The Impact of Pandemic COVID -19 in Workplace.
- [12] <https://www.ibpbooks.com/digital-transformation-recent-trends-and-practices/p/57601>
- [13] "Education: from disruption to recovery". (2020). UNESCO, <https://en.unesco.org/covid19/educationresponse>
- [14] Corona disease (COVID-19) pandemic, (2020). World Health Organization,
- [15] <https://www.euro.who.int/en/health-topics/healthemergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov>.
- [16] Everyone Included: Social Impact of COVID-19, (2020). United Nations, Department of Economic and Social Affairs Social Inclusion, <https://www.un.org/development/desa/dspd/everyoneincluded-covid-19.html>.

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“Machine learning a boon for modern society”

Dr. Brahampal Singh,

Professor (CS & IT), TIIPS, Greater Noida,
GGSSIP University, Delhi, India,

Dr. Ravindra Kumar

Director, TIIPS, Greater Noida,
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Abstract:

The internet has now become an integral component of our daily lives. Our lives are completely reliant on technology. There is a significant contrast between today's life and that of ten years ago. Almost all work was manual ten or twenty years ago, but now it is automated. We never imagined that in the future, before travelling from one location to another, we would be able to verify the exact location of traffic on that route. It was tough to conceive ten years ago that we could order food with a single click! We never considered saying "Ok Google" and expecting someone to respond. I'm not sure what I can do for you.

Our lives have been made much easier by technological advancements. Machine learning is getting more popular as a result of technical advancements. It underpins the revolutionary innovations that support our modern lifestyles, from prediction engines to online TV live streaming. The phrase "machine learning" refers to a collection of techniques and tools that enable computers to learn and adapt on their own.

Machine learning is a significant advancement in the ability of computers to learn. Machine learning takes data from cameras and sensors and applies a variety of approaches to extend the life of a network. Machine learning is based on predictive analysis and is used to anticipate both desired and unwelcome events.

Machine learning provides strategies for generating large amounts of data, extracting information from it, and using that data for a specific goal.

People now live in a smart environment thanks to machine learning. Machine Learning (ML) approaches are used to improve the intelligence and capabilities of a software application. Machine learning offers a variety of strategies that can be applied to smart transportation.

A survey of machine learning, applications of machine learning, contribution of machine learning in smart transportation, smart cities, smart homes, data generation capability of machine learning, uses of machine learning to convert human life into smart human life, and new inventions in this field will be the main focus of this paper.

Keywords: Intelligent Transportation System (ITS), Machine Learning (ML)

Internet of things (IoT), GIS (Geographic Information Systems), Internet of vehicle (IOV)

Automated Highway Systems (AHS)

1. Introduction:

Our lives are now completely reliant on technology. Our lives would be incomplete without the internet or technology. If we are to keep up with the times, we must be knowledgeable of current technology. The majority of our tasks have been converted from manual to automated technologies. This is owing to advancements in technology. Human life has progressed as a result of technical improvement. When ancient India and modern India are compared, it is clear that modern India is more technologically advanced. We can now use an online app to purchase food, make reservations, and so on. E-commerce allows us to buy products. We have the option of reserving a railway seat. We can open a bank account online. These days, there are so many services to choose from.

Computers have the ability to learn and adapt on their own. AI can learn without being explicitly programmed to perform the required action thanks to machine learning techniques. The machine learning algorithm anticipates and performs tasks completely based on the learnt pattern, rather than a predefined programme command, by learning a pattern from sample inputs. Machine learning comes to the rescue in a variety of situations when rigorous algorithms aren't feasible. It will learn the new procedure from past patterns and put what it has learned into action.

These days, machine learning is a popular technique. It is steadily increasing. Machine learning is a set of strategies for teaching computers to learn. This technology is in high demand right now for creating massive amounts of data.

We are using machine learning in our daily life such as Google maps, Google assistant, Alexa, etc.

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3. Contribution of Machine Learning in Smart transportation

Because of the enormous population in modern society, everyone has mobility issues. Because it connects people, transportation plays a critical role.

Any country's growth is dependent on having the best transportation system. As we all know, the demand for transportation is increasing as the population grows. This is the age of globalisation, thus maintaining the economy's rate of growth is critical. Transportation is crucial in this regard. The number of vehicles on the road is increasing every day, resulting in traffic congestion, delayed traffic, and other issues. A significant number of roads and highways are required to manage big amounts of traffic. However, it is an extremely costly and time-consuming operation. However, as the number of automobiles grows, roadways become scarce.

This is not the ideal method of transportation management. Smart strategies should be used to manage large transportation systems.

Machine learning has the potential to play a significant role in this. Machine learning is a type of AI that is used to generate or collect massive amounts of data. Machine learning learns the most recent pattern of historical data in order to develop the analytical model building and to build the nature of the system. The goal of utilising machine learning in transportation is to reduce traffic congestion, improve safety and eliminate human errors, mitigate negative environmental consequences, optimise performance, and increase surface transportation productivity and efficiency.

Prediction methods in transportation, transportation network traffic flows and signals, public transportation, including air fleet, driving etiquette, electric cars, and car sharing are all discussed here.

Machine learning is a critical component of intelligent transportation. It explores interactions with highways, transportation traffic, environmental components, and traffic crashes using a deep learning model.

The amount of time spent travelling is crucial. It can be accomplished in a number of ways, both directly and indirectly. It can be done directly with a vehicle, toll station data, cell phone tracking, and a variety of other technologies. The assessment of traffic volume, speed, and occupancy in point sensors, as well as the vehicle trajectory, is used to calculate journey time indirectly.

The origins of traffic data collection technologies (such as GPS) are extremely useful for gathering massive amounts of traffic data and providing accurate trip time estimation. Machine Learning (ML) technologies are used to improve an application's intelligence and capabilities as the volume of acquired data grows. Route optimization, parking, street lighting, accident prevention/detection, road abnormalities, and infrastructure applications are all covered by smart transportation. Machine learning techniques are extremely beneficial in the development of a strong Intelligent Transportation System (ITS) using IoT applications.

It is clear from the evaluated articles that there is a possible shortage of machine learning coverage for Smart Lighting Systems and Smart Parking applications.

Additionally, the most prominent ITS applications among researchers are route optimization, parking, and accident/detection.

Road traffic management, traveller information systems, public transportation system management, and autonomous vehicles are just a few of the services and applications provided by ITS. It is envisaged that ITS will play a major role in future smart cities, contributing to improved road and traffic safety, transportation and transit efficiency, better energy efficiency, and reduced pollution. ITS is also a good place to generate vast amounts of data.

In the urban environment, the rise in traffic congestion has become a major worry. Traditional traffic control systems, which are plagued by inefficient human resource management, fail to maintain traffic discipline, resulting in increased traffic density and traffic violations. For large-scale vehicle traffic challenges, however, the intelligent transportation system (ITS) can bring safety, efficiency, and sustainability. To ensure a smooth flow of traffic, ITS combines machine learning with the available traffic control force and performs real-time police scheduling.

3.1. Data generation sources for building transportation smart

3.1.1. GPS and GIS data

Many new sources for creating transportation data, mostly travel-related data, are provided by GPS and GIS (Geographic Information Systems). GPS provides data such as distance, vehicle speed, travel time, and so on. There are two types of data that GPS generates. 1. Data from real-time time tracing: - It records the coordinates of a moving vehicle every second. 2. Recording GPS coordinates.

GIS (Geographic Information Systems) is a system for storing data on maps.

3.1.2. Traffic flow data source

These statistics include features such as traffic flow, lane occupancy, and average vehicle speed. Traffic data sources assist in the collection of data such as traffic flow. It relies heavily on sensors and detectors.

3.1.3. Smart card

The use of a smart card has the advantage of displaying the start, end, and direction of travel. Based on the frequency of various places, the management team forecasts and prepares traffic flow and schedules. It aids in the reduction of time and effort.

3.1.4. Mobile phone

It gives the user's exact position. It gathers information about the user's location at various destinations. In a smart phone, the power or battery backup should be adequate. Chargers and other data collection equipment should be available. It gives a high-resolution image of the path, including the vehicle-in and vehicle-out sections of the journey. Smartphone displays everything in a right manner because to its high visibility power and graphical support.

3.1.5. Call detail record (CDRs)

It's a one-of-a-kind feature that stores all of the device's calls in a database. It's a less expensive option. It is useful for transportation model studies because it correctly captures individual travel itineraries.

3.1.6. Connected vehicles

This technology is convenient for the driver because it allows him to profit from increased mobility. Our vehicle is connected to the internet, and this is referred to as vehicle internet (IOV). Using this car transforms it into a smart vehicle, and it transforms transportation into smart transportation. Vehicles are equipped with internet of things (IoT)-based technologies. The vehicle is a next-generation vehicle with advanced technology.

3.1.6.1. Connectivity in connected vehicles

With complete wireless communication, connected vehicles are smaller. It indicates that all wireless devices in the vehicle are operational. It can connect vehicles to sensors, vehicles to vehicles, vehicles to the internet, and so on. Apart from other options like as Bluetooth, Ultra-Wideband, and so on, technology is the most well-known infrastructure in linked vehicles.

3.1.6.2. Intra-vehicle connectivity

Sensors play a critical role in intra-vehicle connectivity. Sensors are critical for security and dependability. Sensors are utilised to strengthen the control system. Sensors are also beneficial in preventing vehicle collisions. When there is a lot of fog on the road, sensors inform the front and behind vehicles. High-speed sensors also trigger a warning.

Sensors of various types are now employed in modern automobiles for a variety of purposes.

3.1.6.3. Inter-vehicle connectivity

Inter-vehicle communication (V2V) plays a vital role in improving road safety, as we all know. VANET (Vehicular ad hoc network) is an acronym for "vehicular ad hoc network." Due to increased construction and high building heights, VANET has numerous issues such as low connectivity and limited V2V communication range.

3.1.6.4. V2I and V2R connectivity

It connects vehicles to ITS infrastructures such as street signs, traffic lights, and road sensors, and so plays a critical role.

The ability to connect to the internet has become a need in modern vehicles.

3.1.7. Safety in connected vehicles

This is an essential component for improving road safety. A vehicle that is connected to other vehicles, the road, and other infrastructure reduces the chances of an accident occurring. After connecting a car, it is important to be mindful of the speed limit, weather conditions, and road conditions. Sensors play a critical role in this.

3.1.8. Smart traffic management in connected vehicles

This function is critical for managing traffic on the road and avoiding congestion. It is also concerned with enhancing data quality. The clearest example of this is the AHS (Automated Highway System), in which all cars operate in a designated lane for automation and connection. It can ensure that the system is clear of collisions.

3.1.9. Clustering analysis in smart transportation

This technology is being used to create a smart transportation system. It's utilised for things like traffic zone division and trip distribution.

3.1.10. Trip generation

The primary goal of this project is to analyse traffic in order to determine the number of journeys. Trip generation [8] is the first stage in the standard transportation forecast model. The purpose of this stage is to estimate how many trips each traffic analysis zone produces or originates.

Traffic zone division

This is used to make challenging city traffic easier to navigate. It is built on the foundation of big data. It improves the precision and reliability of subsequent analyses based on traffic zone division data. It has a significant impact on traffic planning.

In conclusion, we feel that the articles in this special issue contribute to the advancement of the smart transportation sector and open new possibilities for future research into how machine learning may be used to create more sustainable and safer smart cities.

4. Machine learning for building smart cities:

The demand for smart cities is growing as the population grows and people's lives become more hectic. Machine learning and deep learning are crucial in this process.

The smart city is the necessity of the hour for making human existence easier, simpler, safer, and more uniform. Transportation in a smart city will be smart. Smart technology will also aid in the prevention of crimes and robberies, as well as providing a safe environment for all citizens.

Parking is a major issue in metropolitan areas as the population grows. There are many vehicles on the highways and in the city. In train stations, cinemas, shopping malls, and other public spaces, smart parking can help alleviate the problem. Sensor-based

parking can quickly locate a vacant parking space. It will help you save both time and money. Smart city polling can play a key part in solar energy generation, which can be used for a variety of purposes in the city. The distribution of power in a smart city is simple.

Smart cities can help alleviate traffic congestion on roadways by implementing current technology-based traffic and road infrastructure. Smart cities can also help to combat global warming. It is also effective for network congestion, just as it is for traffic congestion. Machine learning can help provide safe transportation as well as solve a variety of traffic issues.

Machine learning has the potential to help reduce pollution in the environment, which is a major issue in smart cities. It can also make human life easier and better.

Education

Machine learning has the potential to play a significant role in online education. It has the potential to improve student retention in online learning. This characteristic is also critical for smart cities.

Health

Machine learning and deep learning have the potential to be very useful in the field of smart health. Several new technologies in the field of health are currently being developed, including cytology pictures, MRI image segmentation methods, and an automated electroencephalogram (EEG) abnormal detection system based on deep learning.

There are a variety of mobile app solutions accessible these days that have gained appeal in terms of assessing diets and monitoring overall health and wellbeing-related features. These multi-access physical monitoring systems, which are frequently utilised in the form of wearable devices that are coupled with mobile apps, help to identify any anomalies in the body owing to nutrient intake inadequacies in people of all ages, resulting in a smart health environment.

Security and privacy of smart cities:

Machine learning and deep learning combined with IoT can play a significant role in ensuring security and privacy in smart cities, which are critical elements. As we all know, everyone is connected via mobile and other gadgets. Unauthorized access is a major concern in this context. Privacy and secrecy are also crucial. During foggy or gloomy weather, the connection will stay active. This will reduce network traffic, resulting in minimal data loss.

5. Machine learning for building smart homes:

Modern society has a huge need for smart technology, and machine learning can help meet that need. In a smart home, a homeowner can unlock the lock on his front entrance automatically from the top floor. All tasks are completed automatically or intelligently by technology. Assume that a person X is waking up with the assistance of a smart alarm clock. Suddenly, this bell sends a signal to the kitchen coffee maker to start brewing coffee for you.

Mr. X will shower and drink coffee until then. Mr. X was not awakened by the alarm clock until 10 a.m. on Sunday since he had taken a long nap that day. Mr. X left his house one day, but he forgot to turn out the light. With the help of his phone, he can turn off the light. He also failed to turn off his refrigerator and television, but thanks to connectivity, he can turn off any equipment using his phone. These are the sole functions that a smart house can accomplish.

How do Smart Home Systems Powered by Machine Learning Work?

here's a lot of misunderstanding about what a smart home is.

A smart home is a Wi-Fi enabled device in which sensors such as temperature sensors, motion sensors, and humidity sensors play a key role in controlling temperature, motion, and humidity.

Applications of Machine Learning in Home Automation

Although Smart Home solutions are unlikely to master context-based decision making in the near future, machine learning has the potential to make linked houses much smarter.

Recognition of people's faces

This is accomplished by the use of video cameras that are linked together. It recognises facial landmarks such as eyes, chin mole, nose, cheeks, and so on. This information is gathered from images captured by cameras. It can also prevent any suspicious person from entering the house.

Access Control Using Biometrics

This is crucial in the development of a smart house. It allows you to identify a person by looking at his photograph or touching his fingertips. Many businesses, like as Samsung, manufacture smart locks for the house. These locks work by scanning the owner's image, or by using the owner's fingertips or passwords. This will contribute to the security of the home or workplace. Biometric access control ensures that devices are used without error. In today's world, biometric devices are used to track employee attendance. Many gadgets contain security features such as fingerprint, pattern, and password recognition.

This is another crucial element of a smart house. Voice recognition technology is used in all of the gadgets. This technique is the subject of numerous studies. This owner exclusively uses his voice to open door locks. Voice recognition can be utilised in a variety of security equipment. This technology is being developed by a number of companies. The voice will be saved in this server's database. When a device recognises a voice, it will take the necessary action.

6. Machine learning and big data generation

Machine learning is a great way to collect a big amount of data. It aids in the creation of a large database on the server of a specific database. Because of this database machine, it has learned a great deal and acts accordingly. This is similar to the programme that we input into a robot, which works as expected.

Machine learning can also aid with large data analytics by improving decision-making algorithms. Machine learning algorithms are used to collect, analyse, and integrate data for large businesses.

As we all know, big data is extremely beneficial to advancement in today's environment. Machine learning generates a vast amount of data.

7. Future or scope of machine learning

In today's culture, machine learning has provided a plethora of cutting-edge equipment and technology that are extremely advantageous to human life. These technologies help people save time and effort. It also reduces the amount of manpower necessary. In numerous industries such as health, education, security, and transportation, machines or devices are now performing all of the labour. However, many new discoveries are still possible.

In the deployment of deep learning and machine learning technologies in smart cities, there are a number of interesting future avenues. When the training and testing data have similar feature sets and distribution models, it is recognised that a training model produces correct results.

Transfer learning is a research area in which the distribution of training and testing is changed or moved from one platform to another. Researchers should also concentrate on integrating semantic technologies into smart city applications in order to improve the interaction between smart gadgets and their users. The usage of virtual objects combined with DRL algorithms would aid in the creation of virtual representations of physical items that could be operated automatically. Finally, the use of smart devices is quite important. Smart city technologies and equipment are frequently mobile and wearable, requiring users to touch screens in small places, which might be difficult for less technically knowledgeable users and senior persons.

Speech recognition technology integration A promising study field is allowing smart gadgets to understand natural language. It is critical to recognise that in the process of developing such intelligent devices, we must not stop there.

8. Conclusion

Machine learning is a critical piece of technology for living a normal life. Machine learning is an effective method for collecting massive amounts of data. From this data, a gadget or machine can learn a multitude of things. Machine learning is critical in the creation of smart homes, smart cities, and smart transportation systems. All machine learning applications, such as speech recognition and picture recognition. Fraud detection, health, education, and transportation are all extremely beneficial in making our lives easier. Deep learning, machine learning, and artificial intelligence are only a few of the technologies that have been developed to improve human existence. Human life has been influenced by smart technology both directly and indirectly. This world is now awash in technology thanks to smart technologies. ITS stands for intelligent transportation system, which has made our transportation more modern, secure, and convenient.

9. Analysis

In this article a review on application of Deep Learning on several aspects of smart city like smart urban modeling, intelligent infrastructures, smart transportation, smart governance, sustainability, smart education, smart health solutions, security and privacy is presented. Several challenges of using deep learning on smart city data are also highlighted. In the end future research directions on usage of deep learning on smart city applications are suggested.

10. References

1. https://www.hindawi.com/journals/jat/2019/4359785/?utm_source=google&utm_medium=cpc&utm_campaign=HDW_MR_KT_GBL_SUB_ADWO_PAIDYNA_JOUR_X&gclid=CjwKCAjw2P-KBhByEiwADBYWCr2KB8xh07znn9mXd4B10HIJPNQ326ps2hjVIY180mRo9VTWIpD4vBoCmqSQA_vD_BwE
2. <https://www.sciencedirect.com/science/article/pii/S2666691X20300142>
3. <https://doaj.org/article/e20afb04a8b44ce09998ccc1c35cd7da>
4. <https://hal.inria.fr/hal-02284820v2/document>
5. <https://onlinelibrary.wiley.com/doi/10.1002/dac.4814>
6. <https://learnz.org.nz/highcountry152/gps-and-gis-technology>

smart city
8. <https://onlinelibrary.wiley.com/doi/full/10.1002/itl2.187>

9. <https://www.researchgate.net/publication/345226030> Machine Learning Approaches in Smart Cities

10. <https://intellectdata.com/building-smart-cities-with-artificial-intelligence-machine-learning/smart-homes>

11. <https://medium.com/swlh/machine-learning-in-smart-homes-5f39e9600cf0>

12. <https://www.iotevolutionworld.com/smart-home/articles/438395-building-smarter-connected-homes-with-machine-learning.htm>

13. Big data

14. <https://www.forbes.com/sites/forbestechcouncil/2020/10/20/how-is-big-data-analytics-using-machine-learning/?sh=560a0e071d29>

15. 4. M. at. el,(2018),Machine Learning for Internet of Things Data Analysis: A Survey , Journal of Digital Communications and Networks, Elsevier, 11–56.

16. 5. E. Fernandes, A. Rahmati, K. Eykholt, and A. Prakash,(2017),Internet of things security research: A rehash of old ideas or new intellectual

17. challenges?,IEEE Security Privacy, 15(4)79–84.

18. 6. S. et al.,(2018),Deep Learning for the Internet of Things, IEEE Journal of Computer, vol. 51, 32–41.

19. 7. S. Al-Sarawi, M. Anbar, K. Alieyan, and M. Alzubaidi,(2017). Internet of things (IoT) communication protocols: Review, in 2017 8th International

20. Conference on Information Technology (ICIT), 685–690.

21. 8. Y. Liu, Y. Kuang, Y. Xiao, and G. Xu,(2018). Sdn-based data transfer security for internet of things, IEEE Internet of Things Journal, vol. 5, 257–268.

22. 9. J. Chen, S. Li, H. Yu, Y. Zhang, D. Raychaudhuri, R. Ravindran, H. Gao, L. Dong, G. Wang, and H. Liu,(2016). Exploiting icn for realizing service-oriented communication in IoT, IEEE Communications Magazine, vol. 54, pp. 24–30.

23. 10. L. et al.,(2015). DeepEar: robust smartphone audio sensing in unconstrained acoustic environments using deep learning, ACM International Conference

24. on Pervasive and Ubiquitous Computing, vol. 1, pp. 283–294.

25. T. Wang, C.-K. Wen, H. Wang, F. Gao, T. Jiang, and S. Jin,(2017),Deep Learning for Wireless Physical Layer:Opportunities and Challenges, IEEE

26. China Communication, vol. 14, pp. 92–111.

27. 12. M. Mohammadi, A. Al-Fuqaha, M. Guizani, and J. Oh,(2018). Semisupervised deep reinforcement learning in support of IoT and smart city services,

28. IEEE Internet of Things Journal, vol. 5, pp. 624–635.

29. 13. N. D. Nguyen, T. Nguyen, and S. Nahavandi,(2017).System design perspective for human-level agents using deep reinforcement learning: A survey, IEEE Access, vol. 5, pp. 27091–27102.

30. 14. A.Ferdowsi and W.Saad.(2017),Deep Learning based Dynamic Water Marking for Secure Signal Authentication in the Internet of Things.

31. 15. A. LHeureux, K. Grolinger, H. F. Elyamany, and M. A. M. Capretz.(2017).Machine Learning With Big Data: Challenges and Approaches. IEEE Access,vol. 5, pp. 7776 – 7797.

32. 16. J. Qiu, Q. Wu, G. Ding, Y. Xu, and S. Feng (2016), “A survey of machine learning for big data processing,” EURASIP Journal of Advance SignalProcess, May 2016.

33. 17. T. E. Bogale, X. Wang, and L. B. Le,(2018). Machine Intelligence Techniques forNext-GenerationContext-AwareWirelessNetworks, Arxiv,vol.19, pp.

1-10.

34. 18. Mandal, I., and Sairam, N.(2012) Accurate prediction of coronary artery disease using reliable diagnosis system, Journal of Medical Systems, 36(5),3353-3373.

35. 19. Salau, A. O.(2018). Development of a vehicle plate number localization technique using computer vision, PhD Thesis, Obafemi Awolowo University,Ile-Ife, Nigeria, 200.

36. 20. Kumar, A., Salau, A.O., Gupta, S. and Paliwal, K.(2019). Recent trends in IoT and its requisition with IoT built engineering: A review. In: Rawat, B.,

37. Trivedi, A., Manhas, S., Karwal, V. (eds) Advances in Signal Processing and Communication. Lecture Notes in Electrical Engineering, 526, 15-25.

38. Springer Singapore. DOI: 10.1007/978-981-13-2553-3_2

39. 21. Buczak, A. L. and Guven, E(2016). A survey of data mining and machine learning methods for cyber security intrusion detection, IEEE

40. Communications Surveys and Tutorials, 18(2), 1153-1176, 2016.

41. 22. M. Mahmud, M. S. Kaiser, A. Hussain, and S. Vassanelli,(2018). Applications of deep learning and reinforcement learning to biological data.

Sustainable Leadership and Organizational Citizenship Behaviour: Exploring Mediating Effect of Corporate Social Responsibility

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Abstract

In this era of cut-throat competition, organizations are always in search of employees who can go one step beyond their formal job description in an effort to enhance productivity. This has drawn considerable attention among management researchers to the concept of organizational citizenship behaviour. Despite the fact that there have been a few studies to understand leadership as a precedent for organizational citizenship behaviour, literature aimed at studying the impact of sustainable leadership on organizational citizenship behaviour is relatively inadequate. The present article aims to analyse and integrate the mediating role of employees' perceived CSR on the relationship between sustainable leadership and organizational citizenship behaviour. Skewness and kurtosis were performed to check the normality of the data, EFA and CFA were performed to check the validity of the instruments, and path analysis was done to check the direct and indirect relationships between the constructs. The results indicate that in IT organizations, where sustainable leadership is encouraged and CSR is also performed well, employees show increased organizational citizenship behaviour. Further, sustainable leadership also increases the CSR initiatives taken by IT

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NEW EDUCATION POLICY 2020: A STUDY OF KEY CHANGES WITH EXISTING NATIONAL POLICY OF EDUCATION (1986)

By

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Abstract

The New Education Policy announced by Dr. K. Kasturirangan as NEP 2020, which was approved by the Government of India on 29 July 2020, The Objective of this policy is to improve the quality of education, credibility of education and addressing the gap in implementation. Education policy is necessary for a country at school and colleges because education leads to economic and social development of any country. The changes that NEP 2020 has recommended were HRD ministry now renamed as ministry of education, GDP investment in Education to increase from 1.6% TO 6% and focusing on gross enrolment ratio it will be increased to 50% by 2035. The education policy has impacted schools and colleges education equally, this article 21 A mainly focuses on free and compulsory education for child age group 6 to 14 years and it's also impact on Higher Education. This paper highlights the key changes of NEP 2020 and analyses the effect of the existing education system.

Keywords: new education policy, national policy on education, higher education.

Introduction

The NEP 2020 replaces the First national education Policy which come in 1968 led by Smt. Indira Gandhi Government and then in 1986 Shri Rajiv Gandhi Government come second national education policy which is modified in 1992 by Shri. P.V. Narasimha Rao. Now after 34 years come new education policy named as NEP2020. In January 2015 Smriti Irani, HRD Minister formed a new committee whose chairman is T. S. R. Subramanian started the working for the New Education Policy, they submit the report, in June 2016.the objective of this committee is to improve the quality of

education but this recommendation was not approved by government later on Dr. Krishna swamy Kasturirangan formed a new committee made up of 9 member They Drafted the national education policy in 2019, this national education policy is finally released NEP2020by Ministry of Human Resource Development, followed by a number of public consultations. T74 Draft NEP was 484 pages.

29th July 2020, The Government of India approved the new education policy after a 34 years gap previously it was known as National policy on education (NPE) in 1986, after some period of time this educational

policy modified in 1992. The main focus of NPE was regarding access and equity of education, here the meaning of access is availability and equity means fairness of education. However today the main focus of NEP 2020 is about quality education. The only major improvement since the last policy of 1986 has been the right of children age group 6 to 14 years for free and compulsory education Act 2009 or Right to Education Act which was an Act of Parliament of India in Acted upon 4th August 2009.

The main purpose of NEP 2020 is to design a vision and framework for both school education and higher education in India. The main focus of this paper is to explain some of the key Changes of NEP 2020.

According to the NEP 2020, propose change the school's academic structure from (10+2 years) of schooling format to (5+3+3+4 years) format. According to (5+3+3+4 years) academic format in India first 3 years is your preschool which consist of KG, LKG and UKG. After preschool when you go to first class and thereafter second class together. This Five years are going to be your Foundation for your education .After the 3years from class 3rd to class 5th will be part of your preparatory or primary schooling, falling by another 3 years i.e. from class 6th to class 8th that will be your middle schooling and finally 4 years from your class 9th to 12th is going to be your secondary schooling go together it forms (5+3+3+4 years) academic structure. If you notice that your first three years of education (KG, LKG and UKG) have

been included the formal education system for the first time.

Now coming to under graduate degree program structure will be available for 3- and 4-years duration. It now has multiple Entry and exit options. Here the means of multiple entry and exit point will explain you with the help of example like if a student chooses to leave the degree at any point during the course of the period, they have the option to return and start whether they left. They will not be required to start the first year of undergraduate course again. Along with multiple entry and exit options students will also receive appropriate certificate for example student will be awarded at diploma for first year undergraduate education, advanced diploma for second year Undergraduate course and bachelor degree for 3 years as well as 4 years courses.

As per new policy NEP 2020 the undergraduate degree program will be credit based. In credit based academic system

1 credit = 1 hours of teaching (Theory)
= 2 hours of practical/field work.

It is a new way that will hopefully provide flexibility in designing curriculum and assigning credit based on the course content and hours of teaching. The higher education institute now will have the option of offering a one year Master degree program under the NEP 2020. Previously if you want to do Master Degree it took 2 years but now the 2nd year of your Master degree will focus on research based study for those who have

completed undergraduate degree of 3 years duration, and for those students who have completed four years of undergraduate degree program with research they will have their Master degree in one year. So basically if you did three year undergraduate course like BBA, B.Sc., B.com etc. so your Master degree will be for two years but in that second year will focus on research so this is an (3+2 years) academic structure and if you did four year undergraduate course like B.Tech so your Master degree will be for one year and that one year will be focus on research so this is an (4+1 year) academic structure.

The NEP 2020 has decided to discontinue M.Phil. (Master in Philosophy) Program. According to NEP 2020 there will be no hard separation between arts and science, between curricular and extracurricular activities etc. NEP 2020 eliminate the harmful barrier between Arts and Science or many different areas of learning. so these are some of the new key changes of the New Educational Policy (NEP) 2020.

Salient Features of NEP 2020: Higher Education

The Fundamental Principles of the Policy

1. Bracketing the unique capabilities of each student, by sensitizing teachers as well as parents to promote each student's holistic development in both academic and non-academic spheres.
2. According the highest priority to achieving Foundational Literacy and Numeracy by all students by Grade 3;
3. Flexibility, so that learners have the ability to choose their learning trajectories and programmes, and thereby choose their own paths in life according to their talents and interests;
4. Hard separations between arts and sciences, between curricular and extra-curricular activities, between vocational and academic streams, etc. in order to eliminate harmful hierarchies among, and silos between different areas of learning.
5. Multidisciplinary and a holistic education across the sciences, social sciences, arts, humanities, and sports for a multidisciplinary world in order to ensure the unity and integrity of all knowledge;
6. Emphasis on concept clearing rather than mugging up.
7. Creativity and critical thinking to encourage logical decision-making and innovation;
8. Ethics and human & Constitutional values like empathy, respect for others, cleanliness, courtesy, democratic spirit, spirit of service, respect for public property, scientific temper, liberty, responsibility, pluralism, equality, and justice;
9. Promoting multilingualism and the power of language in teaching and learning;
10. Life Skills such as communication, cooperation, teamwork, and resilience;

11. Focus on regular formative assessment for learning rather than the summative assessment that encourages today's coaching culture.
12. Extensive use of technology in teaching and learning, removing language barriers, increasing access for Divyang students, and educational planning and management;
13. Respect for diversity and respect for the local context in all curriculum, pedagogy, and policy, always keeping in mind that education is a concurrent subject;
14. Full equity and inclusion as the cornerstone of all educational decisions to ensure that all students are able to thrive in the education system;
15. Synergy in curriculum across all levels of education from early childhood care and education to school education to higher education;
16. Teachers and faculty as the heart of the learning process - their recruitment, continuous professional development, positive working environments and service conditions;
17. A 'light but tight' regulatory framework to ensure integrity, transparency, and resource efficiency of the educational system through audit and public disclosure while encouraging innovation and out-of-the-box ideas through autonomy, good governance, and empowerment; Outstanding research as a co-requisite for outstanding education and development;
18. Continuous review of progress based on sustained research and regular assessment by educational experts;
19. A rootedness and pride in India, and its rich, diverse, ancient and modern culture and knowledge systems and traditions.
20. Education is a public service; access to quality education must be considered a basic right of every child.

Conclusion

Education is an essential and indispensable element for the all-round development of any society and country and a comprehensive national education policy is formulated by a nation to fulfill this requirement. The New National Education Policy, 2020, approved by the Government of India, is an important initiative in this direction. The success of this new education policy will depend on how it is implemented. Therefore, it can be said that India is the country with the youngest population and India's future will depend on providing high-quality educational opportunities to these youth.

References

- Aithal, P. S., & Shubrajyotsna Aithal. (2020), "Analysis of the Indian National Education Policy 2020 towards Achieving its Objectives", *International Journal of Management, Technology, and Social Sciences*, 5(2), 19-41.
- Alhojailan, M. I. (2012). Thematic analysis: a critical review of its process and evaluation. *West East Journal of Social Sciences*, 1(1), 8-21.
- Chopra, Rithika. (2 August 2020). "Explained: Reading the new National Education Policy 2020". The Indian Express.
- Final National Education Policy 2020. (2020). (PDF) (Report). Ministry of Human Resource Development
- Govt. of India (1986). National Education Policy, 1986. <https://web.archive.org/web/20090619075631/http://education.nic.in/cd50years/g/T/49/0T490401.htm>
- Govt. of India (2020). National Education Policy 2020. https://www.mhrd.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
- <https://www.indiatoday.in/education-today/featurephilia/story/nep-2020-what-a-re-the-career-growth-opportunities-in-commerce-stream-by-introduction-of-new-curriculum-1731131-2020-10-13>.
- Jebaraj, Priscilla. (2 August 2020). "The Hindu explains| what has the National Education Policy 2020 proposed?" The Hindu. ISSN 0971-751X
- Muskan Sha, (2020), "National Education Policy 2020", International journal of research.
- Nandini, ed. (29 July 2020). "New Education Policy 2020 Highlights. School and Higher Education to see major changes". Hindustan Times.
- New Education Policy 2020. (2020). Ministry of Human Resource Development, Government of India, English version. https://www.mhrd.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf retrieved on 30th August 2020.
- New Education Policy 2020. (2020). Ministry of Human Resource Development, Government of India, Hindi version. https://www.noticebard.com/wp-content/uploads/2020/07/NEP_final_HINDI_0.pdf retrieved on 30th August 2020.
- New Education Policy a analysis report. (2020). <https://www.studyiq.com/blog/new-education-policy-2020-complete-analysis-free-pdf/> retrieved on 30th August 2020.
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1-13. <https://doi.org/10.1177/1609406917733847>
- NVivo Help (2020). About project maps. http://help-nv11.qsrinternational.com/desktop/concepts/About_project_maps.htm

NVivo Help. (2020). About hierarchy charts.
http://help-nv11.qsrinternational.com/desktop/concepts/about_hierarchy_charts.htm

O'Leary, Z. (2014). *The Essential Guide to Doing Your Research Project* (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Percy, W. H., Kostere, K., & Kostere, S. (2015). The qualitative report generic qualitative research in psychology recommended APA citation generic qualitative research in psychology. *The Qualitative Report*, 20(2), 76-85.

Praveen Jha, Pooja Parvati, (2020), "Long on Rhetoric and Short on substance

National Education Policy, 2020", *Economic and Political review journal*, 55(34).

Shukla, Amandeep. (29 July 2020). "New Education Policy 2020: NEP moots professional standards for teachers". *Hindustan Times*. 10. Dr. D P Sharma on "The Challenges in Indian Education System". *Eduvoice the Voice of Education Industry*. 25 May 2020.

Silova, I., Rappleye, J., & Auld, E. (2020). *Beyond the western horizon: rethinking education, values, and policy transfer*. In *Handbook of Education Policy Studies* (pp. 3-29). Springer, Singapore.

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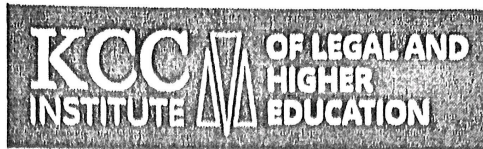
Blockchain Uses for Smart Contract Arbitration

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ABSTRACT

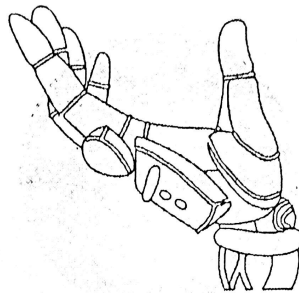
This article explores the twofold effect that blockchain advancements and smart agreements have on debate goal. From one viewpoint, these advancements empower private gatherings to devise arbitral frameworks that are self-upholding and, consequently, generally sidestep the acknowledgment and authorization methodology through which State courts customarily apply a specific command over arbitration. This marvel may in the future permit arbitration to turn out to be totally independent, hence prompting the minimization of State courts. Then again, nonetheless, such a minimization has not occurred at this point; unexpectedly, the new blockchain-related wonder of introductory coin contributions has led to some conspicuous legal disputes. These cases bring up especially fascinating jurisdictional issues, particularly considering the trouble of accommodating the decentralized idea of the blockchain with the regional methodology whereby ward is commonly designated among public courts.



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