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Reconstruction of Smart City: The Matrix a New Approach

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Abstract:
In the notions of smart cities with the partial places where there are limited resources available globally, the intelligence of the systems is introduced. As a result, innovative information, and communication technologies (IICT) that are connected to business, markets, etc. are the primary cause of the emergence of smart cities. Smart city growth and development is centered on the need for technical advancement and improvement in connection with economic development. The development matrix models and implementation process are the main topics of this article. It creates a bridge between the component and the Matrix Format Designs (MFD) of the smart city by deeply integrating Internet of Things (IoT), Big Data (BD), and Cloud Computing (CC). To create a functioning smart city, numerous important technologies come together. It also considers what people need. The Smart City Matrix (SCM) offers a novel strategy and holds significant potential.
Keywords: Innovative Information Communication Technologies, Internet of Things, Big Data, Cloud Computing, Matrix Format Designs, Smart City Matrix

Introduction

A unique aspect of human life is being transformed by smart cities. The green zone, including transportation, health, energy, education, etc., is the area of attention here. As an example, weather data are rapidly and substantially growing. In terms of agricultural development, classifying and extracting useful information from vast amounts of weather data can be extremely helpful. The emergence of smart cities has changed the way that cities are being built all around the world. the use of information and communication technology (ICT) to integrate utilities and transportation in order to monitor data in real time. The goal of the transition to a "Smart City" is not just to increase government efficiency using ICT (ICT). However, it also emphasizes community development by using ICT infrastructure and facilities as facilitators or supporting factors [1]. It also describes itself as a city in the forefront of ICT use. Additionally, it gives the city's quality of life, productivity of urban services, affordability, and sustainability meaning [2]. The concept of "smart cities" boosts energy consumption while efficiently managing resources. Smart cities provide services made possible by the placement of smart objects, the configuration of sensors, and the placement of actuators (SAS). The facilities commonly use data as a motivation. It can also be categorized as either data consumers, data producers, or both. At the city level, smart services are being implemented and creating a ton of data. This gives new duties to those who design and create smart cities. Big data management is characterized by volume, variety, and pace in addition to the challenges (V3). The city functions as a smart city if it is divided into three categories. New Innovative Cities

- Retrofitting existing cities with smart technologies
- Purpose Driven Cities

Researchers from all over the world created a variety of models for the smart city. Different models were created and tailored to meet needs in various contexts. A vision of a smarter city: How cities may lead the way into a profitable and sustainable future was initially published by IBM in a journal in 2009 [16]. According to the 2017 Hong Kong Smart City Blue Print, there are six categories of smart cities: "Smart Mobility," "Smart Living," "Smart Environment," "Smart People," "Smart Government," and "Smart Economy." In addition to the other models described by the researcher, Giffinger claimed that there were six qualities of a smart city that covered intelligent people, an intelligent environment, intelligent living, intelligent transportation, intelligent government, and an intelligent economy [17].

Additionally, the Ministry of Communications and Informatics launched a model that was included in the book of smart city guidelines after it was produced in foreign cities. This smart city model differed slightly from other models in that it focused on smart branding to enable cities to showcase their personalities through their tourism industries. There were 6 elements, including: 1) smart branding; 2) smart economy; 3) smart environment; 4) smart living; and 5) smart society [1].The business that can take advantage of this opportunity may become the next GAFA (Google, Amazon, Facebook, and Apple), but the business that entirely ignores it may eventually be forced off the market. The framework we employed for our research is a very popular technique for start-ups to coordinate their resources and develop their strategy. In the early stages of company planning, new technologies are incorporated into business models to assess their most important components. It might assist upcoming startups in seizing possibilities and overcoming obstacles in the novel business environment. IoT, AI, and blockchain will be at the forefront of the forthcoming technology revolution, which will significantly alter the existing economic landscape and generate innumerable new business opportunities.

Blockchain technology and AI are developing quickly, grabbing the interest of many investors in the ICT sector. From the perspective of the industrial economy, this paper introduces IoT, AI, and blockchain and builds a bridge between business and technology. IoT applications can be found in a variety of fields that are closely related to our daily lives. The Smart City is the first prominent application. Future smart city traffic sensors will make it possible for real-time environmental control and traffic jam detection. Through their cars, the drivers will get the most recent traffic updates. Building-mounted sensors will help with energy conservation and accident prediction. The wirelessly connected self-driving automobile will take over the roles in delivery services and public transit. With the use of real-time data analysis, sensor tags on cars can also raise the level of security. There are layers in the IoT architecture: network, middleware, perception layer. The layer that includes a set of IoT protocols, along with the application layer and business layer (Vashi, 2017). The Open Systems Interconnection (OSI) reference model's physical layer and sensory layer are comparable. It has a variety of sensors, including RFID, QR code, Zigbee, and infrared (Atzori,2010).

Perception's primary job is to gather and recognize data, which can take many different forms depending on what IoT devices need. To protect the communication of collected data, the perception layer communicates with the network layer. The network layer's role is to transmit the obtained data to the upper layer while maintaining the transmission's security and confidentiality in the direction of the main information processing system. The communication uses a variety of pathways, including Bluetooth, Wi-Fi, and 5G, depending on the available technology. To manage various service types linked to various IoT devices, middleware layer is utilized. Additionally, it stores the data from the lower layers in the database so that it may be retrieved when necessary. Based on information collected from the middleware layer, the application layer is used to administer IoT applications and carry out specific tasks required by the business layer. Based on the analysis of the data received from the middleware layer, the business layer is used to build business models, flow charts, and executive reports, which are crucial for decision-makers to formulate the right business strategies.

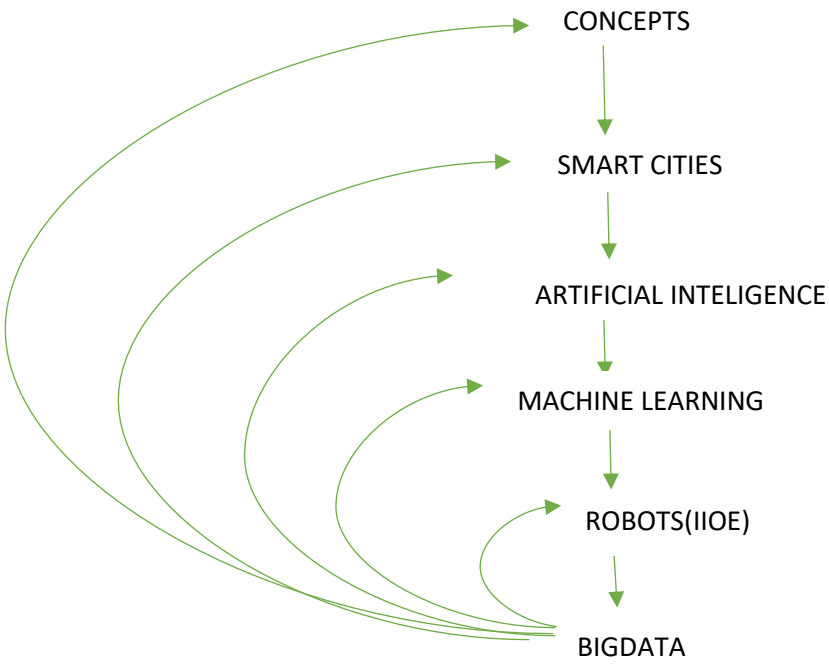

Figure1: Smart City Concept

Smart City: Concept

Regarding renewable energy and transportation, the European Commission advocated the smart city. When minor greenhouse gas emission technology is taken into consideration, a significant opportunity is presented. It rose to the top as a provider of cutting-edge technology and high efficiency. The difficulties mostly relate to the social, cultural, economic, housing, and environmental aspects of urban life. It mainly focuses on research patterns in large cities around the world. A smart city is defined and conceptualized in terms of advancement and innovation as in Figure 1. The concept is utilized globally with numerous terminologies, conceptual frameworks, and creative ideas. There are numerous ideas for replacing the term "smart" with intelligence or digitization. Smart city usage acknowledges the value of labelling in urban areas.

An interconnected, instrumented, intelligent, and innovative metropolis is what is meant by the term "smart city" . As social networks can be changed in the presence of human sensors, home appliances, digital cameras, healthcare equipment, and other comparable encryption decryption structures, instrumentation incorporates live real-world data through these platforms. Innovation, interconnection, and intelligence all depend on combinations of different computing phases. Information is transferred between the many city facilities. Intelligence specifically refers to the existence of advanced analytics, modelling, optimization, and visualization Figure 2.

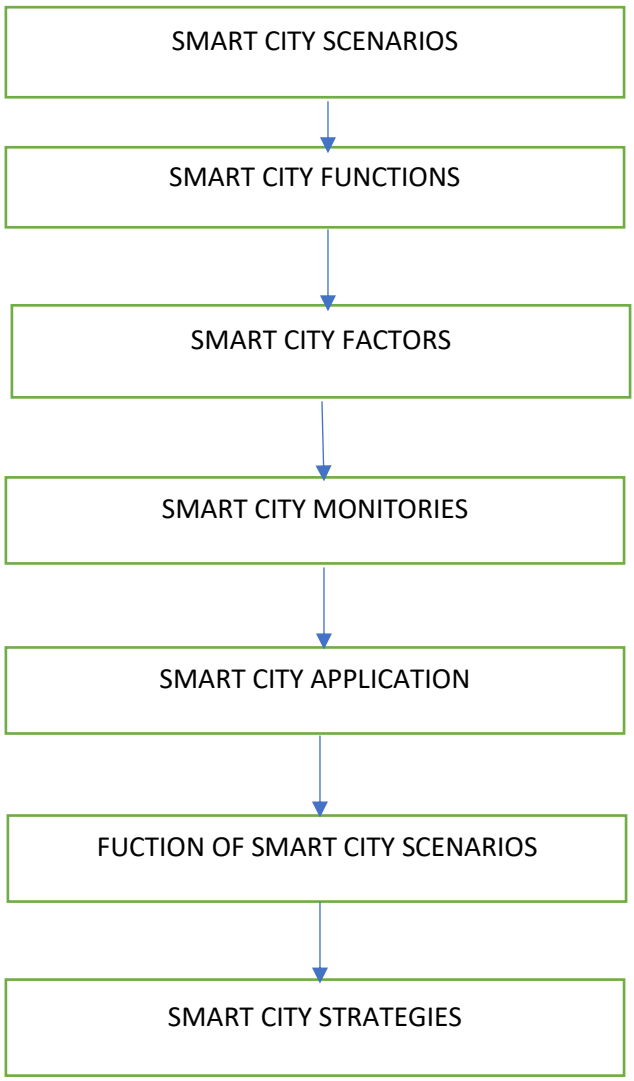

Figure 2: Smart City Intelligence

Artificial Intelligence: Use Of Ai In Smart City

Artificial intelligence is the science of using intellect (AI). Human actions are recognized and taken action upon by machines and programs. AI's main objectives are based on LRP (Learning, Reasoning and Perception). It is possible to make it comprehensive when developing Smart cities. Healthcare, robotics, finance, the global positioning system, and many other fields have previously employed this application. The use of AI in pattern recognition is possible. It is used to access substantial raw data sources. such as weather stations, sensors and actuators on the highways, and ticket sales (public transit).

The government property that receives the raw data has probably installed billions more cameras. All cameras are kept operational and actively record human activity. The number of cars and walkers reads license plates, identifies faces, and builds patterns. It gets information from satellites and broadcasts it. It totals the number of vehicles in the designated location at the designated time. The general people can communicate using roads thanks to the inferred talent. The key area of focus in the creation of a smart city is waste management. An intelligent system is used for data centric implementation. AI in its customs makes decisions on its own. Additionally, it analyses the issues and finds a solution using a recognized pattern. Intelligent cities additionally, the COVID-19 hospitalization empty beds are checked for atomization. Robots are created to administer medications to COVID sufferers. Additionally, automatic sanitization is used. AI is faster and more accurate than humans at data analysis and

information gathering from data. In mechatronics, robotics, and autonomous systems (MRA) are well-known. It mostly extends in startup and applications for smart cities. The RAS uses AI and ML to adjust situations and processes that lack human agency. AI's current goal is to emulate human brain architecture. In DL, which includes ML, the city brain is developed as brain-like tissues that can operate and communicate with data on the internet. The use of technology that mimics human behavior shows where AI will be in the future and how robotic applications on the internet of things will work. Technology and intelligent machine operation are essential to the inventive smart city. Cities' AI is influenced by governance, socioeconomic factors, and physical, intellectual, and information resources. The convergence of new trends, possibilities, and difficulties is what makes smart cities so interesting. AI and robotics attract attention to the key players who have shaped much of the development of smart city concepts.

Usage Of Deep Learning (Dl) And Importance Of IoT- In Smart City

Deep Learning (DL) is a technique that is successfully used. It is used to analyze and synthesize many types of data, such as still photos, speech recognition, text identification, pattern recognition, etc. There is a large amount of digital data available in smart cities that is sent via sensors. DL made progress in the field of AI in the days and years that followed. Data analysis for digital transformation is the result. In smart cities, it is used to forecast air quality. The platform used for application implementation is called DL. A series of learning models are employed. how the issues of energy maintenance, waste disposal, and leak detection might be resolved.

Actuators understand the engines when they are created and trained using DL approaches since they can then function automatically. With the necessary implementation, reinforcement learning (RL) largely improves reward-based interactions. Agent refers to the RL algorithm that engages in interaction and learning. By using the best policy, an agent object. A policy is a plan of action, and the best policies maximise long-term benefits.

Cities where most utilization of AI and Robotics takes place is tabulated

City/Country	Artificial Intelligence/Robotics
London (UK)	1. Artificial Intelligence 2. Robotics
Sydney (Australia)	1. Robotics
Moscow (Russia)	1. Artificial Intelligence 2. Robotics
Hong Kong (China)	1. Artificial Intelligence 2. Robotics
Dubai (UAE)	1. Artificial Intelligence

Table 1: City Utilization of AI & Robotics

The establishment of sophisticated and real-time observation using big data has transformed knowledge and government as in Table 1.

The development of the Internet of Things, energy-efficient LED lighting, and cloud computing, as well as the proliferation of low-cost sensors, citywide wifi, and affordable lighting, have all made significant contributions to smart city initiatives. The development of cloud computing has also facilitated the purchase of these complex devices and allowed cities to scale analytics.

AI Algorithm:

A wide range of municipal tasks and operations are being automated and improved as part of Smart City programs, which increasingly use AI algorithms. These initiatives vary greatly from one situation to the next, but most of them have as their overarching objectives enhancing livability, boosting urban competitiveness, and enhancing environmental sustainability.

The robots can do a variety of jobs and even work for humans. One of the breakthrough technologies that will significantly alter economics is artificial intelligence (AI). AI has already defeated the top-ranked Go player, and some of its applications such as video suggestions, production recommendations, spam filters, and navigation systems have been used in our daily lives. In addition to remembering every method in its database, AlphaGo is also capable of coming up with brand-new strategies that have never been employed before. Robots that resemble humans, like Sophia, can converse with people in a variety of languages naturally. Today, chatbots, chatgpt [6] like those found on Amazon Echo and Google Home are highly popular. They can help us with a variety of tasks, including taking care of the house and giving us the most recent information, there is a need. From the perspective of the business, big data is gathered from customers to predict market trends. The use of chatbots [6] in the healthcare sector is also quite promising.

Of terms of perception, prediction, and decision-making, AI is also the fundamental technology in autonomous vehicle systems.

For example, AI-driven computer vision systems could allow computers to simultaneously recognize millions of elements of urban life, such as people, cars, workers from the government, waste, accidents, fires, and disasters. Depending on how each of these elements behave, how those behaviors change over the course of a day or over time, and how the elements interact with the city systems, the system might also allow autonomous decision-making. Upgrades to parking and traffic control are currently available thanks to AI-based smart city efforts. The safe integration of autonomous ride-sharing vehicles into future projects is possible. All smart cities often incorporate energy, the environment, transportation, intelligent buildings, governance, and social rules.

Machine Learning and ANN

More emphasis is placed on algorithm creation in machine learning (ML) so that the computer can automatically get better as it gains experience. Performance of the machine learning algorithm is based on classification, clustering, and regression (CCR). Sorting new data based on existing data structures is done through classification. Without knowing the data's structure, clustering is used to separate out the commonalities in the data. Regression: establish a prediction model to foretell the direction of the data by determining the correlation between various variables. Artificial neural network (ANN) and support vector machine are two machine learning models (SVM). The basic building block of a human brain is a neuron. It is utilised to process the data and send it to the following neuron. The network structure of the human brain is made up of connections between various neurons. With the help of an artificial neural network (ANN), which simulates the human brain, a computer may carry out classification and pattern recognition tasks. With the help of an artificial neural network (ANN), which simulates the human brain, a computer may carry out classification and pattern recognition tasks. For the large diversity of the dataset, ANN can be used to separate the information without human or particularly programming for computer.

Smart City & Big Data

To cut costs and resource usage, the smart city makes use of cutting-edge technology like wireless sensor networks (WSN). The use of big data analytics in a smart environment is still in its early stages, though. Big data analytics is one of the cutting-edge technologies with enormous potential to improve smart city services (Al Nuaimi et al., 2015). Various data sources, including smartphones, computers, sensors, cameras, global positioning systems, social networking sites, business transactions, and games, are currently producing a lot of data.

Because the amount of data generated in the current digitized world is constantly increasing, traditional data mining and analytics platforms have faced difficulties. The vast quantities of data generated by sensor devices can be used in big data analytics to extract valuable information. Successful big data analysis and application is essential for many commercial and service fields, including the smart city application. To process the streams of data produced in a smart city setting, large computing and storage facilities must be made available. This is only one of the numerous benefits and challenges connected to the use of big data in a smart city. Relying on cloud computing and Internet of Things (IoT)

technology is one of the potential ways to take use of this benefit. The promise of a smart city causes data to grow exponentially by several orders of magnitude.
Big data, which refers to such vast amounts of data, is therefore at the heart of the services provided by the IoT. Big data is a phenomenon that has long been distinguished by its volume, velocity, and wide range of data kinds that are being produced at an ever-increasing rate. Big data provides the possibility for the city to gain insightful knowledge from a sizable amount of data gathered from diverse sources.
Compared to huge data gathered using conventional methods, such data undoubtedly has more unstructured aspects. The landscape of smart technologies with big data and cloud computing is depicted in Figure 3, where different smart applications exchange information using embedded sensor devices and other devices integrated with the cloud-computing infrastructure to produce significant amounts of unstructured data. Using distributed fault tolerant databases like Not Only SQL, which are used to enhance a single service or application and are shared among many services, these substantial amounts of unstructured data are gathered and stored in the cloud or data Centre. As a result, data analytics can employ the programming paradigm for processing huge data sets with parallel algorithms to get value from the stored data.

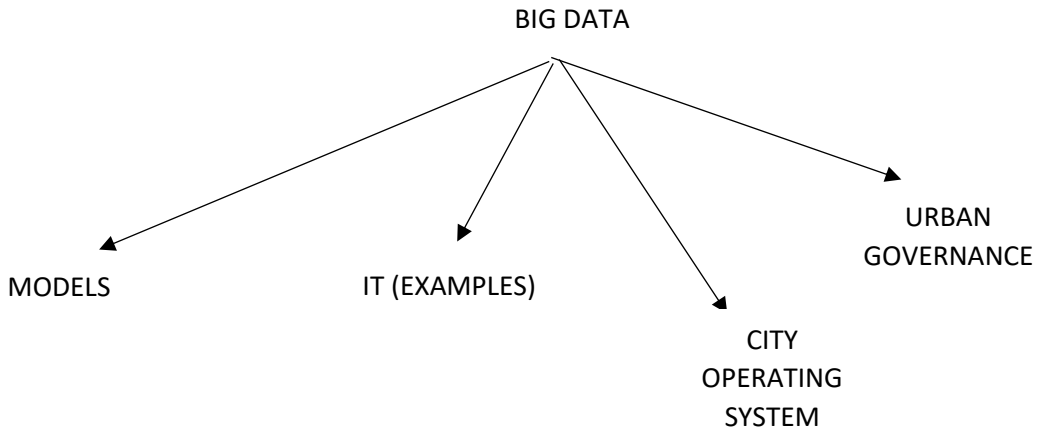

Figure 3: Big Data Purpose

The purpose of this study is to provide a thorough overview of big data in smart cities, with a focus on its contribution to sustainability and raising urban living standards. So, there are two reasons why this paper is motivated. The first is the existing accessibility of smart devices, which daily produce sizable heterogeneous datasets. The second factor is smart applications, which provide a seamless connectivity between various elements needed to realize a smart city. Our study, however, varies from earlier works by offering a thorough and in-depth analysis of contemporary technologies and by outlining the structure of big data in smart cities. Big data, smart cities, city planning, and intelligent services for big data science are all linked fields of study. In addition to providing a conceptual IoT framework with cloud computing at its core, the work also provides a model of end-to-end interaction between various stakeholders in a cloud-centric IoT framework, making the model equivalent to the big data architecture in a smart city.

The development of Internet of Things (IoT) technologies and the growth of big data have had a significant impact on the viability of smart city programs. The IoT enables the integration of sensors, radio-frequency identification, and Bluetooth in the real-world environment using highly networked services, and big data offers the opportunity for cities to acquire important insights from a significant quantity of data collected from multiple sources. Future smart cities face new and intriguing issues as a result of the IoT and big data coming together in research areas that have not yet been fully explored. In order for cities to fulfil the vision, guiding principles, and requirements of the applications of smart cities, they must first solve difficulties linked to business and technology. Modern communication technologies and smart-based applications utilized in the context of smart cities are presented in this

study. By concentrating on how big data might fundamentally alter urban populations at various levels, the ambitions of big data analytics to enable smart cities are examined. In addition, a big data business model for smart cities is suggested, and the difficulties in business and technology research are noted. For future advancement and development of smart cities in the context of bigdata, academics and companies can use this study as a benchmark.

Key Features. Big Data Are:

Increased velocity that is

- Developed in real-time functionality;
- Variety in structured and unstructured temporally and spatially identified;
- Use of smaller or bigger sample sizes in small data studies;
- Increased amount (terabytes or petabytes) of data information;

Upcoming Technologies Related To Smart City:

Smart networks are needed to connect the components of smart cities, including the citizens' equipment like cars, smart home gadgets, and smartphones. This network should be able to convey data received from sources to locations where big data is gathered, stored, and processed, as well as responses back to the many organizations in the smart city that require them. For real-time big data applications for smart cities, network quality of service (QoS) support is crucial. All current distributed application events should be sent in these applications in real time to the processing location. These events can be transmitted from their sources either as unfiltered, unaggregated events, or as raw events. Various technologies that the smart city environment can take advantage of, such as big data and IoT for smart cities. The IoT technology, which enables various things to be detected and controlled remotely through existing network infrastructure, must be put into place if the smart city is to be adopted.

Smart City Cloud Computing Integration

The integration of these technologies with IoT to reap the rewards of a smart city is a significant issue, despite the flexibility and low prices that cloud computing technologies promise to offer for hosting huge data. Despite recent significant advancements in cloud computing services, there are still a number of security, administrative, and open platform concerns when using them to integrate smart cities. The requirement to move specific data and procedures from behind the firewall and into the cloud causes these problems. It is necessary to provide an appropriate cloud business architecture to solve concerns with cloud integration, security, management, and platform adaptability for smart city applications. Additionally, the capacity to adapt services to consumer preferences or demands draws a lot of customers to such telecommunications companies, boosting income. Additionally, cloud service providers generate revenue through data center colocation by hosting their systems at many vendor locations, making it easier to offer services in various or diverse geographic locations.

Data integration

Data from smart cities is collected in several ways from several embedded intelligent things. Data integration inside the smart city is one of the major obstacles that must be overcome, but the objective of the smart city is to combine such a big amount of data from many sources. A number of technologies have recently been incorporated into smart cities, lowering the technical hurdles to handling the data. However, if the data are inaccurate, missing, in the wrong format, or incomplete, data quality is one of the most difficult issues to solve in any data integration system.

Computational Intelligence Algorithms For Smart City Bigdata Analytics

In knowledge engineering, which includes soft computing, machine learning, and data mining, computational intelligence algorithms are effective, efficient, and robust. Examples include neural networks, genetic algorithms, artificial bee colonies and particle swarm optimization, cuckoo search

algorithms, flower pollination algorithms, chicken swarm optimization, and bat algorithms. The durability, usefulness, and efficiency of computational intelligence algorithms are however restricted to tiny data sets. As a result, big data analytics for smart cities cannot use these algorithms. The computational intelligence techniques now used in big data analytics are no longer relevant due to the huge data produced by the smart city. Computational intelligence algorithms often become less effective, efficient, and robust as the size of the data set rises, making them unsuitable for analyzing knowledge in big data produced by the smart city.

IoT Based Smart Village System

In Smart Village IoT based System (SVIBS) is a large and complicated category with several application domains that is developed to provide value-added services for various qualities of the village and for the inhabitants. The Smart village mission, which strives to utilise the most cutting-edge communication technology, is designed to be supported by rural development. The cloud-based system and the worldwide focus on trash, energy, and water management and conservation play crucial roles in expanding the linked benefits of the smart village beyond the utility's distribution, automation, and monitoring activities. Consumers will be able to monitor their own consumption and modify behavior with the aid of IoT-based monitoring systems. Future versions of the suggested devices will automatically regulate by using off-peak energy times and connecting to sensors to track occupancy. For those attributes, a trash collecting system, lighting conditions, and optimum irrigation management are included.

a job board and application process for farmers are provided by an Android app. This Android app provides centralized management. It is crucial to consider the views of most Indians who reside in villages if India is to become intelligent. It is now vital to change rural dwellers' perspectives because they increasingly utilize smart phones with a range of useful applications. It is really simple to change one's perspective and understand the concept of a smart community thanks to modern information technology. A smart community is one in which individuals may interact and respect one another. To deliver digital devices to every villager would take a significant number of people and a lot of resources, yet our nation is not very wealthy. This essay was created after researching how villagers spend their lives and how smartphones are utilised to improve the quality of life for those who reside there. For the village to be open to the outside world, smart people are essential for planning the social structure of the village using their talents for innovation and interpersonal relationships. Finding a lot of intelligent people in Indian communities is difficult. In order to create a group of intelligent individuals for each hamlet. The group is in charge of producing more intelligent people. Most people in our country live in cities. Therefore, both scholars and governments focus their efforts on creating smart cities that are environmentally friendly and technologically cutting edge. These cities can make wise and prudent use of their resources. The villages can apply the same concept. In a country with a farming-based economy like India, the rural population makes up a sizable share of the overall population. Villagers' lives are also harder than those of their counterparts in cities. The improvement of urban life must go hand in hand with efforts to advance rural communities. There are several smart city concepts that can be applied straight to villages. As an illustration, consider the employment of cameras and sensors for street surveillance, medical monitoring, etc. On the other hand, there are some industries that require some creative concepts for smart working, such as agricultural, cattle/livestock rearing, etc. The many elements of villages have been considered in the sections below, as well as how the IoT and smart village model might improve the quality of life in villages. Finding all the items that will communicate with one another is the first stage in constructing a smart town. Then, several sensors, security cameras, emergency buttons and switches, and other fixed equipment will be placed. These Internet-connected sensors and devices will generate enormous volumes of data that can be processed and stored on cloud servers. Using Big Data analytics tools like Hadoop, this data may be further evaluated for the best use. Smart houses, weather systems, education, surveillance systems, and smart agriculture are among the future goals. The technologies used and areas of interest in smart villages are summarized in Figs. 3 and 4.

Cost savings can be achieved in an IoT-based smart village through increasing productivity, asset utilization, and process efficiency. Using sensors and communication devices, which can benefit from real-time data and analytics to assist them make better judgments, the tracking of devices is improved. There will be additional opportunities for people, businesses, and sectors as a result of the expansion and convergence of data, processes, and things on the internet.
This intricate network is developed with sensors and hundreds of networking and processing devices. Such a complicated real-time system will have considerably higher operational and maintenance costs, which is obvious to meet strict reliability and efficiency improvement requirements. Each field must be equipped with highly effective and dependable sensors and data control units in the event of a smart irrigation management system. For the country's overall development and improvement, villages more than cities must be made smart. creating possibilities for young people in villages to discourage migration to cities. In order to achieve the best output and sell at profitable pricing for the future rural development, farming is a lucrative career that offers direction and mentorship to farmers. Correct implementation oversees benefits like crop insurance, soil health cards, and insecticides that can benefit the general populace.

Smart Irrigation System
Poor irrigation management has an impact on agricultural production, hence it's important to design techniques to maximize irrigation. Automated irrigation systems regulate the monitoring and control of numerous field-derived parameters, including humidity, water level, temperature, and human contact. This system is made up of controllers and a wireless sensor network that transmits the values that are detected. Numerous automated systems that support farmers can increase the production. In the field, sensors can be positioned anywhere, and the system is tested for various temperatures. Only the smallest amount of variation is seen in the sensor output. The IoT's communications infrastructure has been quickly improving in recent years to satisfy demand from both physical world "things" and "humans." As a result, smart devices are used to control distant things. The drip irrigation system that is a part of the smart irrigation network.

Health Monitoring System
A new avenue for health monitoring systems was made possible by the development of wireless communications and embedded technologies. One of the most difficult interventions in support of smart villages that are in distant places is remote health monitoring utilizing wearable technologies like sensors and cellphones. the architecture for health care monitoring communications that makes room for stationary nurses and medical units. Patient smartphone connected to sensor through wearable interface. This uses internet technology to gather data from all the sensors, giving the user restricted access to view and manage the appliances in his home. The government or the central power has complete access to all traits and may also manipulate them.
The promise of a smart city leads to an exponential increase in data by several orders of magnitude. Consequently, such enormous volumes of data or big data are at the core of the services rendered by the IoT. The phenomenon of big data has long been characterized by volume, velocity, and a variety of data types that have been created at ever-increasing rates. Big data offers the potential for the city to obtain valuable insights from a considerable amount of data collected through various sources. Certainly, the characteristics of such data mostly include unstructured features compared with big data collected by other means. Figure 1 illustrates the landscape of the smart technologies with big data and cloud computing, in which various smart applications exchange information using embedded sensor devices and other devices integrated with the cloud-computing infrastructure to generate large amounts of unstructured data. These large amounts of unstructured data are collected and stored in the cloud or data center using distributed fault tolerant databases such as Not Only SQL, which is used to improve a single service or application and is shared among various services. Thus, the programming model for processing large data sets with parallel algorithms can be used for data analytics to obtain value from the stored data.
System on Chips Design (SoC)-IoT implementation for Smart City Technology

The requirement for SoC-IoT is
-Capacity and Latency (Automotive)
-Scalability (Diversity)
-velocity (Data Transfer)
-Agility (Updatable)
-Efficient Compute (Everywhere)
-Ecosystem (Diversity and Choice)
The IoT is being hailed as the next big in smart city innovation plays a very important role. The specific prediction varies but the number of electronics devices connecting through the internet is anticipated to increase dramatically with the IoT representing tens of billions of devices in just the next several years. The edge nodes that form the link between the individual devices and gateways that connect to the cloud. Then supply makers and diagrams with all the building blocks from embedded processing and connectivity to sensors, security and software and tie all together with a rich ecosystem of the design tools.
Next big design that brings intelligence innovation depends on

- Ease of Use
- Integrated Solution
- Conserve Power
- Extend battery life
- Ensure Data Security
- Conform to Wireless Standard

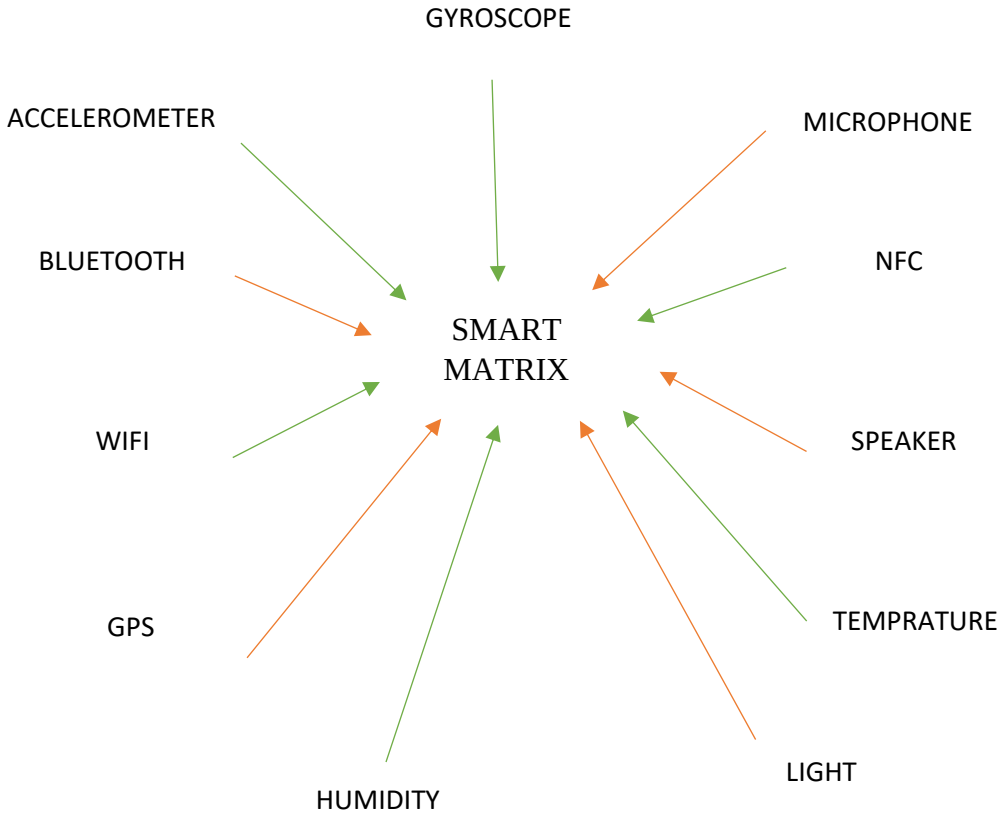

Figure 4: New Innovation Smart Matrix of IoT(Application Based)

Conclusion

The purpose of this paper is to attempt to describe the increasingly popular concept of the "smart city. "The literature was thoroughly examined, and it became clear that a smart city has many different

meanings. In addition to ICTs, people and community characteristics are now mentioned while talking about smart cities. The research of the existing literature led to the discovery of numerous components and attributes that define a smart city. Results demonstrate how challenging it is to measure a smart city. The development of some comprehensive indexes has been examined. Since the authors feel that such an assessment should be suited to a certain city's vision, this research was not intended to provide a new framework for the evaluation of a city's smartness. This study aims to define the definition of the smart city, a term that is becoming more and more common. The definition of a "smart city" is complex, according to a thorough review of the literature. Nowadays, attributes of communities and people are mentioned alongside ICTs while talking about smart cities. The review of the current literature revealed numerous characteristics and aspects of a smart city. The findings highlight how difficult it is to measure a smart city. We have looked at a few initiatives to build all-encompassing indexes. The authors of this research did not want to establish a new paradigm for evaluating a city's smartness, as they believe that such an evaluation should be customised to a specific city's vision.

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