

NAVIGATING THE FUTURE : UNVEILING THE DYNAMICS OF INDUSTRY 5.0

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PREFACE

In an era marked by technological revolutions, the concept of Industry 5.0 stands at the forefront, promising a paradigm shift in the way industries operate. As we navigate the ever-evolving landscape unravel the intricacies and possibilities that Industry 5.0 holds. “Navigating the Future” invites all attendees to be active contributors to the ongoing dialogue that shapes the future on industries, fostering a community of forward – thinkers and innovators who are well – equipped to drive positive change in the world of Industry 5.0

Industry 5.0 is regarded as a fifth industrial revolution in which consumers could satisfy their individual requirements as per the tastes and expectations. Although the repetitive tasks are done by robots in Industry 4.0 which is at the mass customization level, Industry 5.0 aims to perform mass personalization with help of Artificial Intelligence.

Industry 5.0 is expected to revolutionize the production process with higher autonomy to collaborative robots. Industry 5.0 is the futuristic industrial revolution which is expected to bring in more creativity and innovation in the products by allowing robots to perform repetitive tasks. It is expected to utilize the creative intellectual capability of human optimally. Moving from mass production to custom manufacturing techniques and production system digitization and intelligentization.

In the lines if above, the PG & Research Department of Commerce has organized two days Conference on the theme “Navigating the Future: Unveiling the Dynamics of Industry 5.0” with the following objectives, to understand and gain knowledge on the functional areas of Industry 5.0; to provide a holistic understanding of the multifaceted dynamics of Industry 5.0 and to enhance the research aptitude among the academicians, scholars towards dynamic changing environment.

To get more insights on the above theme, research articles were invited for presentation and publication. The Department has received fifty (50) articles on various sub-themes from Professors and research scholars of various colleges in Tamil Nadu, Kerala and Karnataka. The Editorial Board has reviewed and edited all the papers scrupulously and meticulously with plagiarism check.

The Editorial Board has recommended and forwarded all the articles in the form of Edited Book with ISBN Publication Number for disseminating the knowledge to all the stakeholders of Higher Education Institutions and Industry concerned.

This book is a comprehensive guide for understanding and utilizing on various themes to generate indepth knowledge on it and suitable for research scholars as well as corporates. We hope that you will find this book informative and inquisitive as much as we learnt it.

Editorial Board.

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INTERNET OF THINGS CONCEPT AND APPLICATIONS: A REVIEW

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Abstract:

Innovation plays a crucial part in our day-to-day lives, and we all depend on it to get the most extreme advantage and consolation. Today, the Internet is not only used to communicate and trade data; things can also use the Internet for communication and trade, and this term is called the Internet of Things (IoT). The shape of communication presently is human-human or human-device. The concept of IoT revolves around the interconnectedness of devices and objects through the internet, enabling them to communicate, collect, and exchange data seamlessly. It represents a paradigm shift in how we perceive and interact with our surroundings, infusing everyday objects with intelligence and connectivity.

Introduction:

As the world becomes increasingly interconnected, the Internet of Things has emerged as an informative force in various industries and everyday life. Internet of Things signifies not just a technological evolution, but a societal shift towards a more connected, intelligent, and sustainable future. One of the most compelling aspects of IoT lies in its potential to enhance efficiency and convenience in our daily lives. Imagine a world where household appliances anticipate our needs, vehicles communicate with traffic signals to optimize routes, and wearable devices monitor our health in real time. This interconnected web of smart devices has the power to streamline processes, conserve resources, and improve overall quality of life.

History

As we stand on the precipice of a new decade, the Internet of Things has permeated virtually every aspect of our lives. From smart cities and autonomous vehicles to precision agriculture and remote healthcare, IoT continues to redefine how we interact with the world around us. With advancements in artificial intelligence, edge computing, and 5G technology, the potential for IoT innovation is boundless, promising to reshape industries, empower communities, and usher in a new era of connectivity and intelligence.

In retrospect, the history of the Internet of Things is a testament to human ingenuity, collaboration, and the relentless pursuit of progress. The concept has evolved into a transformative force that is reshaping the fabric of society, offering boundless opportunities for innovation and advancement. As we embark on this journey into an increasingly interconnected future, one thing remains certain: the Internet of Things will continue to push the boundaries of what is possible, enriching lives and driving positive change for generations to come.

Each thing is interestingly identifiable through its implanted computing framework but can inter-operate inside the existing Web foundation. Specialists estimate that the IoT will comprise nearly 50 billion objects by 2020. British business visionary Kevin Ashton coined the term in 1999 while working at Auto-ID Labs (initially called Auto-ID centers, alluding to a worldwide arrangement of radio-frequency recognizable proof (RFID)-associated objects).

Technologies Involved in IoT Development: Internet/Web and Organizing Nuts and Bolts OSI Show * Networking advances to empower IoT gadgets to communicate with other gadgets, applications, and administrations running in the cloud. The web depends on standardized conventions to guarantee that communication between heterogeneous gadgets is secure and dependable. Standard conventions show rules and designs that gadgets use to build up, oversee systems, and transmit information over those systems. Networks are a "stack" of innovations.

An innovation such as Bluetooth LE is at the bottom of the stack. The applications running on the best of those layers use technologies at the top of the stack, such as message-lining advances. Choosing one arranged convention over another and challenges related to organizing inside the IoT: run, transfer speed, control utilization, irregular network, interoperability, and security.

Smart Home Automation: IoT-enabled devices such as smart thermostats, lighting systems, and appliances allow homeowners to automate and control various aspects of their homes remotely. Through smartphone apps or voice commands, users can adjust temperature settings, dim lights, or even brew coffee before they step foot inside their homes.

Home Security: IoT-based security systems offer advanced monitoring and surveillance capabilities, providing homeowners with peace of mind and enhanced protection. Smart cameras, doorbell cameras, and motion sensors can send real-time alerts to smartphones, allowing users to monitor their homes and respond to potential threats from anywhere.

Energy Management: IoT technology plays a pivotal role in optimizing energy consumption and reducing utility costs in homes. Smart meters, energy monitoring devices, and smart plugs enable users to track their energy usage in real time and identify opportunities for efficiency improvements. Automated systems can adjust heating, cooling, and lighting based on occupancy patterns and environmental conditions, further maximizing energy savings.

Health and Wellness: IoT devices are increasingly being utilized to promote health and wellness within the home environment. From smart scales and fitness trackers to sleep monitors and air quality sensors, these devices provide valuable insights into personal health metrics and environmental conditions, empowering users to make informed lifestyle choices.

Real-time Monitoring and Analytics: IoT sensors deployed across utility infrastructure enable real-time monitoring of consumption patterns and performance metrics. Smart meters, equipped with advanced sensors and communication capabilities, provide

granular insights into electricity, water, and gas usage, allowing consumers and utility providers to track consumption levels, detect anomalies, and identify opportunities for optimization.

Predictive Maintenance: IoT technology facilitates predictive maintenance of utility infrastructure, helping to prevent costly breakdowns and minimize downtime. By analyzing data collected from sensors embedded in equipment such as transformers, pumps, and pipelines, maintenance teams can detect early signs of potential failures, schedule proactive repairs, and optimize asset performance, thereby extending their lifespan and reducing maintenance costs.

Conclusions:

The future of IoT hinges on collaboration and partnership among stakeholders across industries, academia, government, and civil society. Building an inclusive and interoperable IoT ecosystem requires collective efforts to develop standards, protocols, and best practices that ensure security, privacy, and sustainability while fostering innovation and economic growth. The Internet of Things represents a paradigm shift in how we perceive and interact with the world around us. By harnessing the power of connectivity, data analytics, and automation, IoT has the potential to address some of the most pressing challenges facing humanity while unlocking new frontiers of opportunity and progress. As we navigate the complexities and opportunities of the IoT landscape, we must remain vigilant, collaborative, and ethically grounded in our pursuit of a smarter, more connected future.

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