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Integrating Big data Analytics and Cloud Computing for the Effective Utilization of the Internet of Things (IoT)

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Perspective

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DESCRIPTION

Since the last decade the advancement in software, and networks and the migration from virtualization to a niche containerization eco-system made the long-sought vision of cloud computing possible. Cloud providers like Amazon, Google, and Microsoft compete with a wide portfolio of pay-as-you-go services. These services have the potential of sparking new, innovative, and affordable products more than simple IT outsourcing.

This Special Issue (SI) depicts a comprehensive study and thoughtful evaluation of the state-of-the-art research and development related to the unique needs of electrical utility IOT devices, including operational technology, IT, storage, processing, communication systems, technical and economic solutions for the attainment of a future

electric smart IOT devices model. Big data and the Internet of Things (IoT) are two hot topics on top of mind for business leaders. Together they have been making a significant impact on companies' ability to capture and analyze data to drive business decisions. In today's environment, there are many situations where the Internet of Things and big data work hand in hand with each other. However, they evolved as separate technologies and have some differences as well.

A notional objective of bringing a big data framework to IOT devices confronts several potential issues and pitfalls in terms of IOT devices' infrastructure, architecture, interfacing, standardization, protocols, security, reliability, communication, optimization, and sustainable strategies for smart IOT devices. IoT and big data have many overlapping components, and IoT is considered a major source of big data.

This SI aims to present detailed research carried out in the field of information technology and communication systems in smart cities, IoT devices, and large-scale power systems. Different planning, operational, and implementation aspects are fully incorporated. In the current environment, the complex data and information gathered by IoT devices can be considered a big data set being gathered in real-time.

Current advancements toward future IOT devices will necessitate the collection and analysis of data from integrated devices such as distributed storage, intelligent loads, and distributed energy resources. Big data analytics can provide different types of insights when used with the IoT; namely, descriptive analytics, diagnostic analytics, predictive analytics, and prescriptive analytics. Descriptive analytics gives insights into how a connected device is performing in real-time. It can be used for anything from locating a connected device to understanding how that device is used by customers, to identifying anomalies. Data visualization is an important aspect of IoT analysis, aiding in the ability to identify key trends. Data visualization is needed to properly identify and convey the best data insights that can be used to drive business decisions. The data generated by IoT devices is heterogeneous, meaning it comes in a variety of formats: structured, unstructured, and semi-structured.

The enormous volume of data necessitates an effective platform that propels smart IOT devices forward in the big data era. All these problems and their prospective solutions are discussed in different sections of the SI.This Special Issue aims at publishing high-quality manuscripts covering new research on topics related to the Integration of cloud computing and Big data for better IOT utilization including but not limited to the following:-

- Cloud Migration
- Cloud architecture
- Hybrid Cloud and its benefits and pitfalls.
- Public, private and hybrid clouds
- Interoperability and portability
- Microservices and containerization
- Virtualization *vs*. Containerization
- Internet on Things(IoT)

CONCLUSION

This SI also describes how the DevOps framework and Cloud architecture altogether have been used to display

energy in two scenarios: A single house and smart IOT devices with thousands of smart meters. The use of the two scenarios is to show the IOT device's status and enable dynamic demand responses implying that the same framework may be used to do smarter IOT device data analyses.