**"IoT Considerations, Requirements, and Architectures for Smart Buildings—Energy Optimization and Next-Generation Building Management Systems"**

**"Contributions/Findings/Conclusions"**

- Explained the architecture of IOT (Internet of Things) in BMS (Building Management System).
- Presented the advantages of POE (Power Over Ethernet), an IOT based implementation, in BMS (Building Management System).
- Presented the difficulties faced by BMS in saving energy if IOT solution is not implemented.
- "Energy consumption in USA is 9% of its GDP which amounts to 1.3T$ annually". IOT implementation in BMS can help improve the energy saving each year by 20%.

**"Technology Insights"**

- IOT based BMS (Building Management System) not only helps in reducing building energy consumption but also works in management of other areas such as surveillance, fire detection, elevators, electrical systems etc.
- Advance software automation in IOT plays a key role in enabling "integrated energy management".
- Big data gathered by the large number of IoT devices in the commercial buildings is stored into cloud networks which allow users to control the power consumption through mobile applications in smartphones.
- POE (Power Over Ethernet) allows BMS system to transfer both data and power through same cables.

**"Key Insights"**

- Large amount of data is getting generated from the increasing number of building equipment and devices. Cloud based scalable solutions play a key role in making BMS work efficiently.
- With the help of "IP-networking", energy utilization and the other important building management tasks can be controlled from a remote data centre efficiently.
- Ethernet uses different signalling technique for data transfer and power transfer; therefore, power transmission does not impact data transmission over same cable.
- POE allows users to control lighting inside the buildings smartly and efficiently. Visible light communication (VLC) provide huge advantages in "vehicle to vehicle communication" and "inside airplane communication".

"**Improving Utility of GPU in Accelerating Industrial Applications with User-Centered Automatic Code Translation"**

**"Contributions/Findings/Conclusions"**

- Explained and summarized the IOT big data architecture in cloud platforms.
- Projected numerous open challenges in transferring of big data from distributed sources to cloud.
- Data processing efficiency is highly scaled when the "Data storage system" starts supporting IOT devices, as a result offering massive rewards to the IoT software applications.
- The concept of parallel computing using GPU can greatly help in processing structured or unstructured Big data collected from numerous sources.

**"Technology Insights"**

- MapReduce implementation using Hadoop is one of the most important parallel data processing technique in IOT cloud.
- COT (Cloud of Things) is the new term associated with the integration of IOT and cloud. It allows collection of big data from various real time machines and process it clearly.
- "Control over UDP" (CoUDP) provides smooth data transmission for various IOT applications.
- Cloud provides three main services: "Infrastructure as a Service (IAAS), Platform as a Service (PAAS), Software as a Service (SAAS)".

**"Key Insights"**

- From the three layers in IOT big data architecture, the most important is Application layer which contains "middleware and business models". All the analysis and data processing are done in application layer.
- Billions of data is generated from millions of equipment and devices in metropolitan cities. Cloud can easily store this increasing volume of data and can help in faster communication between IOT devices.
- Cloud helps to monitor and manage big data from any part of the world and takes no time in the implementation.
- A big challenge to IOT implementation is the integration of various structured and unstructured data.

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