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QOS APPLICATIONS IN INTERNET OF THINGS

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Abstract
The Internet of Things (IoT) is known to be an ecosystem comprising smart objects equipped with sensors, networking and processing technologies that integrate and work together to provide an environment in which end-users receive smart services. Through the world in which smart services are given to use any operation anywhere and anytime, the IoT brings various benefits to human life. By using the smart applications in IoT, the end users will satisfy with their work in very smart way. The IoT brings positive impacts across the world through human life in which smart utilities are given to use any operation anywhere and at any time. The Quality of Service(QoS) will provide various services to different applications in several ways.

Keywords: Internet of Things, Monitoring, Quality of Service

I. INTRODUCTION

Detection of applications is now smart applications that are prevalent. Sensing capacity will finally be incorporated and integrated into our living environments beyond smartphones, laptops and wearable devices. The recent growth in sensing applications is distinguished by the dispersed gathering of data for the purpose of exchanging local climate by either self-selected or trained users, increasing global knowledge of topics of concern, computing neighbourhood statistics, and mapping physical items.

Big Data has spurred the revolution of smart sensing and LBS, which in turn enriches Big Data in terms of data volume and application scale. Every digital process and social media exchange produces Big Data. Besides physical locations, velocity, direction, and acceleration are all involved in Big Data applications.However, applications for Big Data are becoming more selective, because the explosive increase in sensed data will easily overwhelm the computing resources that people currently have. Therefore, sensing should proceed by extracting meaningful value from Big Data, requiring optimal processing power, analysis capabilities and skills.

The transmission metadata from all clients is collected from Internet of Things (IoT) devices, and we use it to automatically establish the mapping between the spatial location spot and wireless signal strength distribution. When the sensing data obtained from each use reaches a certain amount, the features of locations could be extracted through crowdsourcing. All of these elements bode well for the needs of crowdsourcing and Big Data, where little can be assumed about users, and explicit input or other action from users is best avoided.

There are two kinds of sensing approaches based on Big Data: device-based sensing and device-free sensing. Device-based sensing approaches allow users to carry around a mobile phone or other wireless devices, while device-free sensing approaches allow sensing the target without attaching any electronic devices in wireless environments. The following applications were used as smart applications by IoT.

According to the existing review papers, the existing deficiencies propose that we provide a comprehensive literature review to address these weaknesses as follows:

- The present studies do not provide any analytical assessment and taxonomy for application approaches in IoT of figure 1[1].
- Some studies do not evaluate the important assessment factors on applications in IoT.
- The structure of the presented studies does not have the systematic arrangement and the paper selection method is not clear.

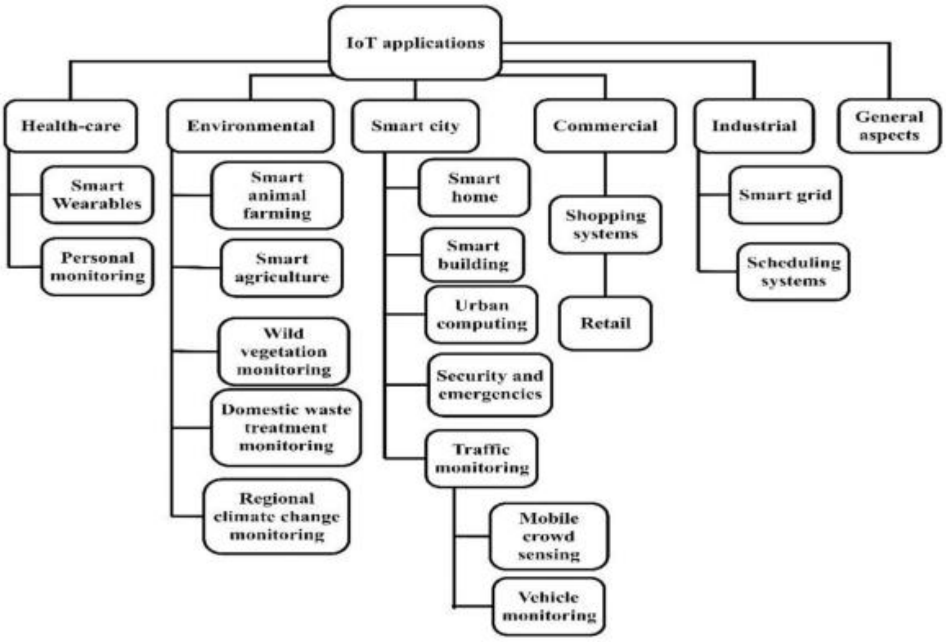

Figure 1Various types of IoT Applications

The present IoT applications are shown in the graph as mentioned below[2]:

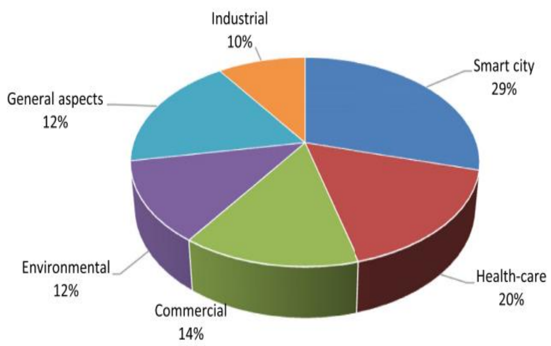

Figure 2 Percentage of IoT applications

This figure 2 shows us that consequently it is not possible to process all collected data by them that generate big data. It means that the collected data may not have any value without analysing, interpreting, and understanding them[3][4]. Context-aware computing makes it feasible to store context information related to sensor data. Therefore, the interpretation of them can be done simply and more expressively. Furthermore, awareness of the context information makes the machine to machine communication performance more easer.

Quality of service is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow. For example, a required bit rate, delay, jitter, packet dropping probability and/or bit error rate may be guaranteed. Quality of service guarantees are important if the network capacity is insufficient, especially for real-time streaming multimedia applications such as voice over IP, online games and IP-TV, since these often require fixed bit rate and are delay sensitive, and in networks where the capacity is a limited resource, for example in cellular data communication. A network or protocol that supports QoS may agree on a traffic contract with the application software and reserve capacity in the network nodes, for example during a session establishment phase.

During the session it may monitor the achieved level of performance, for example the data rate and delay, and dynamically control scheduling priorities in the network nodes. It may release the reserved capacity during a tear down phase. A best-effort network or service does not support quality of service. An alternative to complex QoS control mechanisms is to provide high quality communication over a best-effort network by over-provisioning the capacity so that it is sufficient for the expected peak traffic load. The resulting absence of network congestion eliminates the need for QoS mechanisms. QoS is sometimes used as a quality measure, with many alternative definitions, rather than referring to the ability to reserve resources.

Quality of service sometimes refers to the level of quality of service, i.e. the guaranteed service quality. High QoS is often confused with a high level of performance or achieved service quality, for example high bit rate, low latency and low bit error probability. An alternative and disputable definition of QoS, used especially in application layer services such as telephony and streaming video, is requirements on a metric that reflects or predicts the subjectively experienced quality. In this context, QoS is the acceptable cumulative effect on subscriber satisfaction of all imperfections affecting the service.

II MONITORING SOLUTIONS

2.1 Level Monitoring Solutions

With Level Monitoring solutions, we can remotely monitor liquid level inside the tank/reservoir in real-time. These solutions allow us to access the fluid level information, temperature, and RH on mobile phones as well as desktops[5]. Using these solutions, you will be able to manage inventory effectively. The real-time visibility awareness of the days left in existing stock and theft for multiple locations at a time.

Figure 3 Applications of IoT

2.2 Fuel Tank Level Monitoring

The solution is implementable for both Mobile Fuel tanks as well as Gas Station and Diesel tank monitoring purposes(distributors/supervisors) to know the real-time fuel stock level in their tanks remotely[6]. The solution is scalable enough to cover any size of the fleet. It saves the company time by giving the exact fuel dispenses. This way, it will be able to optimize your inventory levels.

2.3 Smart Farming Solutions

The advent of technology has helped multiple sectors in attaining profitability. One such sector is agriculture. Internet of Things (IoT) implementation in this field has resulted in the term smart farming[7]. IoT in smart farming is the future of precision farming and results in high quality produce and healthy cattle. With the use of many smart farming sensors, and wearables, one can get real-time update with a touch of the screen.

2.4 Gas Monitoring Systems

Detect the presence of toxic gases and asphyxiants such as H_2S, Methane, and CO in your industrial facilities or commercial buildings through our gas monitoring solutions[7]. Ensure workers' safety, comply with industrial standards, and avert catastrophic tragedies by instantly detecting leaks and taking immediate actions to prevent their spread through gas detection and monitoring system.

2.5 Fire Hazard Prevention

Preclude fire breakout in your facility with temperature monitoring and gas detection systems[8]. Use the solution to keep your workers and equipment safe from fires caused unexpectedly due to the ignition of combustible gases like propane and methane. Get alerts about presence of such gases or increasing temperatures through gas analyzers and monitors of our solution; and take immediate actions to curb fires and explosions.

2.6 Oxygen Level Measurement

Leverage our gas detection solutions to maintain proper oxygen levels for optimum performance of your workers[9][10]. A decrease in O2 levels can cause dizziness among workers (working in mines etc.), severe brain damage, or even death. The real-time gas monitoring solution will alert you about decreasing oxygen and enable you to evacuate workers before their health gets affected.

2.7 Environmental Monitoring Solution

An IoT powered environmental monitoring solution is a tool to assess the surrounding's safety. Closed space areas like offices, homes, warehouses, museums can be monitored with the help of this smart solution[11][12]. It is skillfully developed to reduce the workload, detect the presence of pollutants, and obtain real-time information about the surroundings, while keeping up with safety and health protection. The solution aims on improving your well-being and work efficiency to further enhance overall productivity. A smart environmental monitoring system gives you the benefit of maintaining a proper record of the ambiance for a personalized experience.

2.8 Air Quality Measurement

The presence of particulate matter in the atmosphere has an immediate effect on your health[12]. Therefore, a sensor-enabled environmental monitoring system is used to identify and reduce the presence of pollutants around us. It accurately detects the presence of particulate matter in the air and generates alerts about its concentration. Whether in offices, houses, or any closed space, the solution is effective enough to rely on. It provides favourable working and surviving conditions to keep the surrounding air fresh and healthier to breathe. The solution is fully automatic and you can customize the requirements to improve the environment.

2.9 Water Quality Monitoring

Clean and fresh drinking water is an essential resource for survival, and IoT technology is efficiently used to measure water quality parameters[13]. By using the environmental monitoring solution, it is possible to measure the quality of water in real-time . It significantly results in efficient operations and improved production rate. It can detect turbidity, pH level, temperature, dissolved oxygen, TDS, and salinity to improve water quality for several purposes. The solution helps in gaining water quality information through smart IoT techniques and performs advanced analytics to enhance the production rate.

III MERITS OF MONITORING SMART APPLICATIONS

- Uses advanced algorithms to measure accurate fuel levels
- Immediate alerts are sent on the interconnected smart gadget
- Centralized dashboard shows the tank levels at a glance
- It can set the desired threshold limits for the fuel levels
- Cloud-enabled advanced data management technique

- Highly comprehensive for seamless connectivity with other solutions
- Provides actionable insights to improve decision-making
- One platform for all managerial tasks
- Custom-branded solution for easy configuration with any device, server, or communication protocol

IV CONCLUSION

Incidentally, the Internet of Things has altered the operability in this sector. Across the world and businesses, the hospitality industry has transformed and revolutionized itself. IoT helps to render hyper-personalization along with real-time solutions for the guests' queries, redefining the meaning of IoT in the Hospitality industry altogether. Also, IoT has succoured humans across the globe by saving them time and energy and providing them with repose in their everyday lives. The individuals of the modern society are experiencing effortless living through impactful IoT strategies. Connecting comfort with budget friendly solutions is a forte that IOT has crafted significantly well within a short time frame.

V REFERENCES

1. *Souri, A., Asghari, P. &Rezaei, R. Software as a service based CRM providers in the cloud computing: Challenges and technical issues. Journal Server Sciences Res 9, 219–237 (2017).*
2. *Son N. Han, Imran Khan, GyuMyoung Lee, Noel Crespi, Roch H. Glitho, Service composition for IP smart object using realtime Web protocols: Concept and research challenges,Computer Standards & Interfaces,Volume 43, Pages 79-90 (2016).*
3. *Roberto Casadei, Giancarlo Fortino, DaniloPianini, Wilma Russo, Claudio Savaglio, MirkoViroli, Modelling and simulation of Opportunistic IoT Services with Aggregate Computing,Future Generation Computer Systems,Volume 91, Pages 252-262 (2019).*
4. *Shapna Muralidharan, Abhishek Roy, Navrati Saxena,MDP-IoT: MDP based interest forwarding for heterogeneous traffic in IoT-NDN environment, Future Generation Computer Systems,Volume 79, Part 3,Pages 892-908(2018).*
5. *S. Li, L.D. Xu, S. Zhao, The Internet of Things: A Survey, Information Systems Front. 17 (2) Pg. 243–259 (2015).*
6. *F. Aznoli, N.J. Navimipour, Cloud services recommendation: reviewing the recent advances and suggesting the future research directions, Journal Network Computational Applications. 77 Pg.73–86(2017).*
7. *B. Kitchenham, et al., Systematic literature reviews in software engineering – a tertiary study, Information Software Technology, 52 (8) Pg.792–805(2010).*
8. *S. Kim, S. Kim, User preference for an IoT healthcare application for lifestyle disease management, Telecommunications. Pol. 42 (4) Pg.304–314(2018).*
9. *R.M. Savola, H. Abie, M. Sihvonen, Towards metrics-driven adaptive security management in e-health IoT applications, in: Proceedings of the 7th International Conference on Body Area Networks, ICST (Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering), 2012, February, pp. 276–281.*
10. *M. Effatparvar, M. Dehghan, A.M. Rahmani, A comprehensive survey of energy-aware routing protocols in wireless body area sensor networks, Journal Medical Systems. 40 (9) (2016) 201.*
11. *N.-S. Kim, K. Lee, J.-H. Ryu, Study on IoT based wild vegetation community ecological monitoring system, in: Proceedings of the Seventh International Conference on Ubiquitous and Future Networks (ICUFN), IEEE, 2015.*
12. *Y. Cheng, et al., AirCloud: a cloud-based air-quality monitoring system for everyone, in: Proceedings of the Twelfth ACM Conference on Embedded Network Sensor Systems, ACM, 2014.*
13. *F. Montori, L. Bedogni, L. Bononi, A collaborative Internet of Things architecture for smart cities and environmental monitoring, IEEE Internet Things. 5 (2) Pg. 592–605 (2015).*