Internet of Things (IoT)

Your Name (First M. Last)

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 **Annotated bibliography**

**Hassan, W. H. (2019). Current research on Internet of Things (IoT) security: A survey. *Computer Networks*, *148*, 283-294.**

In this research paper, Hassan is turning the attention of readers towards the significance of IoT security issues. He claims that there are some objectives served by IoT which include preserving privacy, ensuring the security of the user, confidentiality of the data and infrastructure and guarantee the availability of the IoT services of the IoT ecosystem. Another major aspect of this study is that it presents work, advancement, and research being done in the field of IoT from 2016 till 2018. Central contribution of this research is the provision of an overview of the current states and circumstances of the IoT security research, stimulators, modelers and relevant tools, etc.

**Zeinab, K. A. M., & Elmustafa, S. A. A. (2017). Internet of Things applications, challenges, and related future technologies. *World Scientific News*, *2*(67), 126-148.**

In this study, Zeinab is shedding a light on mounting the importance of IoT and says that it is becoming the center of attention of the researchers. She also claims that it has become an important technology that is facilitating human life as it allows communication between different objects and everything being possessed by people. IoT is famous for sensors being attached to the systems in which wired or wireless structures are present in the real world. One of the most interesting things being mentioned is that using the IoT technology world would become smarter no matter which field one talks about. IoT would be there everywhere and would improve means as smart cities, smart healthcare, smarter houses, and buildings, etc.

**Zhou, W., Jia, Y., Peng, A., Zhang, Y., & Liu, P. (2018). The effect of IoT new features on security and privacy: New threats, existing solutions, and challenges yet to be solved. *IEEE Internet of Things Journal*, *6*(2), 1606-1616.**

In this work, Zhou sheds a light on the fact that with growing importance of IoT, its applications also grew in number. There are innumerable fields of social production and social living such as industrial automation, healthcare, and energy, etc. in which Internet of Things (IoT) is taking life beyond the expected level. Author in this work also claims that this fact must not be negated that if things have advantages, there are some threats and challenges as well attached, that must be dealt wisely. Furthermore, this research article spots a light on the variety of solutions, found by experts.

**Summary**

 Internet of Things (IoT) has become one of the most popular topics, for the last few years. IoT refers towards things that are connected with internet so that exchange of data between things could take place easily. Machines and devices connected with IoT improve both human lives and way of working as things could be monitored easily. Though, numbers of functions being performed by IoT but at the same time, challenges and privacy threats linked with IoT must be considered. Solutions provided by researchers and experts assist in extracting maximum benefits out of this latest technology that is committed to facilitate human lives.

**Introduction**

 With the advancement of time, a revolution has been witnessed in technology and one of the best parts of technological advancement is the "Internet of Things". It is interesting to know IoT and its purposes. The Internet of Things or IoT is the extending power of the internet that went beyond the smartphones and computers to the whole range of processes, things, and environment. Internet of things is the latest technology and system of interrelated mechanical, computing devices, objects, animals and digital machines provided with the unique identifier. The ability to transfer information data without a human-to-human or human-to-computer interaction is the central feature of IoT. Kevin Ashton was the first person who mentioned the Internet of things in his presentation in 1999 that he made for Procter and Gamble. It has evolved from the convergence of wireless technology. In a nutshell, the Internet of Things is a conception of connecting devices to the IoT which not only keeps a record of data collected but at the same time helps in the sharing of information.

**Discussion**

Internet of Things (IoT) is a term used for representing general concept for the ability of various network devices that not only sense but collect data from the surrounding world. This data is then shared and used through the internet which is then processed and used for various purposes. According to Vandana, IoT consists of smart machines that communicate and interact with other objects, machines, infrastructure and environment. People connect themselves with others by using different ways of communication and among all; the most popular source of communication is internet. So, it won’t be wrong to say that internet is connecting people. Application of IoT could be found everywhere. According to Arafatur and his co-works, the Internet of Things (IoT) is playing the role of the technical tool by turning the physical resources into smart entities by working in the existing frameworks and infrastructures. One of the basic reasons for IoT' popularity is its aim of providing seamless and smart service and approaches to all the users without any disruption or interruption. IoT paradigm focuses on formulating complex and effective information systems by combining the sensor data acquisition, effective data exchange system through networking, artificial intelligence, big data, clouds, and machine learning, etc. (Zeinab et al, 2017). According to Asyhari, another major aspect that must be taken into consideration regarding IoT is the collection of information and maintenance of its confidentiality as an independent entity. One of the main concerns linked with IoT is the provision of privacy and security. Challenges arises in using and advancing the existing technologies and these technologies includes new policies and application, protective protocols, analytical tools for IoT-generated data, etc. All these challenges and security threats review the latest contribution of IoT application frameworks along with the advancement of their supporting technologies. Taking into account importance of IoT, Asyhari claims that propagation of the solutions is of extreme importance. Industrial stakeholders are making untiring efforts for leveraging the opportunities along with minimizing the challenges in terms of usage of this state of art technological development and advancement that keeps the world and individual integrated.

 Internet of Things (IoT) is envisioned to grow more due to the rapid proliferation of the advancement of communication technology, availability of the computational systems and devices. According to Hassan, despite several areas in which IoT has been used extensively security risk could be looked upon as main concern in safeguarding networks of the IoT system and hardware. Some of the main existing examples of IoT use includes self-driving vehicles for an automated system, microgrids (that distribute the energy) and Smart City Drones, etc. Hassan and his colleagues were of the view that IoT mechanism aims at protecting privacy and preserving confidentiality of both infrastructure and the users. Hassan mainly discusses IoT security and authentication in his research (Hassan et al, 2019). He believes authentication helps in identifying devices and users in any network and grant access only to authorized individuals.

Critical evaluation of IoT depicts, along with the provision of multiple benefits there are some challenges and threats as well that must be resolved by the experts. Most of the researchers highlight only the positive side of the project and negate the negative aspects connected with it. According to Statista (a website of statistics), devices connected with IoT would increase dramatically from 20.35 billion (recorded in 2017) to 75.44 billion in 2025. It is interesting to note that nowadays there is no single area in which IoT intervention could not be witnessed. IoT has become the hour of the need because of the sluggishness of people and desire of controlling everything remotely. These are the key drivers that made IoT important than ever before. Zhou and his other research fellows believe that with the fitting of sensors everywhere arose more risk. Though security has been provided and every device has its particular id that facilitates the communication but with the mounting popularity of IoT and risk of cyber-attacks is also increasing.

Zhou in his work highlights the increasing cyber-attacks that are improving with technological advancement and are posing serious threats to privacy and security. He also gives an example of remotes adversaries that sometimes compromise the patient's implanted medical devices that not only pose economical loses but also put their lives at risk (Zhou et al, 2018). Zhou not only spots a light of the darker side by mentioning the risks and threats but at the same time, he supports the use of IoT by pointing towards the increasing number of solutions proposed against vulnerabilities, information leakage, and cyber-attacks. The flow of the information between the devices if managed properly, most of the risks could be minimized before causing severe damage to the privacy and security.

**Conclusion**

Keeping the above-mentioned facts and research work of experts in consideration, it could be said that this reality cannot be denied that IoT is complex technological advancement that poses many threats and challenges particularly in regards of privacy and security. Privacy and security concerns are rising high with time but still this technology is evolving at an exponential rate. In almost all the fields of the world, the utilization of IoT could be witnessed easily. IoT is becoming the need of the hour as it is transforming business, lives, and world by introducing an initiative that was never thought of before. It is important to understand that technologies come with some pros and cons. One of the biggest threats that have been noticed in IoT is security, privacy challenges and risks. Things go side by side and this could be observed best in IoT as challenges and threats are treated with great care and experts in IoT are providing best solutions for dealing with the risks. Development of the new features in IoT reflects upon the new areas of field that are being focused on (Gubbi et al, 2013). So as a whole, it could be concluded that IoT is widely used in all the fields of life as sensors, processors and communication facilitators that help in improving human life as it gets them the control over different systems and devices. Technology advancement such as IoT inculcates a sense in the users that utilization of certain technologies poses challenges but if related threats are dealt sensibly and efficiently, risks could be mitigated by finding the best solutions that would increase positive aspects of utilization of IoT.

 References

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