Education and the Internet of Everything

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Abstract: The Internet of things has opened new doors for internet and mobile applications and expanded the technology to become what is called the Internet of Everything IoE by experts. As the name implies, the internet is now evolving around everything in our lives. Education is one of the big players in today's economy and as such it shall be affected by the wide spread use of internet tools in education. But, how is the internet of everything is going to influence Education, now and in the future. Some applications of the Internet of everything are predictable but what are the most important uses of connected applications in the educational sector. This research shall explore these new sectors and explain how they shall shape the future of education.

Key words: Internet of everything, education, internet of things, IoE

INTRODUCTION

The internet is today used in all sectors and fields. Education is one of the major fields that employ internet technologies. Universities are expanding their course offerings to include online settings (Akyildiz *et al.*, 2002). Blended courses are also taking place at universities and colleges all over the world. Learning is now not confined to a fixed location, students can learn from a distance using their, PC's, Laptops, Pads and mobile phones (Ashton, 2009). The educational environment are becoming more collaborative and integrated; new applications are emerging to accommodate the new educational shift to the online platform (Atzori *et al.*, 2010).

Today, the dissemination of knowledge is no longer confined to a college or university settings. Cloud computing, digital and open courses, large scale wifi connections, video lecturing and on demand information providers are providing knowledge tools and services throughout the world wide web (Akyildiz *et al.*, 2002).

The internet of Things has made the use of connected devices and applications a new platform for knowledge transfer and dissemination among students and professors. Some universities are adopting the hybrid system while others are using the complete virtual learning model and their by offering a complete distance learning environments. This research aims at exploring the how the internet of everything shall impact education and what are the factors that shall have a profound change on the delivery of knowledge for educational purposes among students and professors (Velusamy *et al.*, 2013).

MATERIALS AND METHODS

Education and the internet of everything: The internet of everything is the normal progression of the Internet of Things (IoT) and it is about connectivity between devices and application available through the internet (Atzori *et al.*, 2010). The name was born when Kevin Ashton was working with a network of devices connected over the internet (Akyildiz *et al.*, 2002). It is expected that around 50 billion devices shall be connected over the Internet by 2020. The devices making the internet of things range from mobile phones, laptops, smart watches, vending machines, cars, refrigerators and sensors that are connect through the internet to provide a service to its users.

Internet of everything: As the term implies, the internet of everything is connecting everything that can be connected over a network (Ashton, 2009). People, devices, process and data are making networked connectivity more valuable and rewarding to persons and organizations. Some challenge that this shall lead to even more complex networks and high speed communication mediums.

Information technology infrastructures has became even more complex. The introduction of IPv6 allowed for all type of devices to obtain it own unique IP address leading to more innovative applications and ideas to emerge online (Atzori *et al.*, 2010).

The internet of everything is creating new opportunities through its ability to include all connected devices, enabling for the sharing of new data resources and integrating these data in new processes enabling for advanced collaboration between humans and devices to

generate new services and products with unlimited possibilities (Ashton, 2009). The internet of everything is coming to life through collaboration and partnership between governmental and nongovernmental organizations. Cisco a major networking providers identified many uses for the internet of things that shall help improve our lives all over the planet.

RESULTS AND DISCUSSION

Impact on education: We have witnessed several educational implementation that involved the use of the internet and web technologies (Atzori *et al.*, 2010). New education technology organizations emerged in the last couple of years reflecting a move towards investment in this new innovative medium for educational use. Today there are connected schools and universities that opens the door for the digital educational revolution to advance and prosper based on the internet of everything technology and infrastructure. This new type of smart connected education shall impact our educational systems in the following ways.

Students engagement: Addressing students needs is a challenging task since there are varying abilities between each individual students and the other. Students with special needs take extra resources and attention from educators and professionals. Special needs students face many difficulties at schools and at home. The use of connected devices shall make life easier for these students (Ashton, 2009). The new educational technology can include special QR code tools used by students with hearing or visual difficulties to make his education experience customized based on his needs. Connected devices can monitor the vital signs and needs of special needs students and provide the services Just in Time even before the student think about what he or she needs. The technology can allow student with special need to handle all the processes needed to go by his school life as a regular student.

The internet of things bring in new opportunities for educators to explore new techniques for engaging students and using innovative means for curriculum design and delivery using advanced tools to help students succeed (Ashton, 2009). New connected educational tools and devices shall allow more access to technology applications in the classroom (Barakat, 2012). This type of technology shall allow more Students to engage in classroom learning and collaborative learning. The use of shared etwork resources and devices through a universal communication medium shall have profound effect on future education.

In traditional educational settings, students rely on their knowledge acquired from class or call someone he know or ask his parents to help him solve their homework. However, with the Internet of everything applications schools can give their students complete access around the clock to class materials and resources, online library access and online collaboration tools with their instructors to allow them to find the solution to their homework thereby encouraging collaboration and engagement.

Enhanced productivity: The availability of wifi networks globally has made it very easy for people to interact and engage in real time learning and education experience (Cheng, 2009). The Internet of everything shall create new job roles that Educational institutions need to overhaul their business to provide the skill sets needed for internet of things future job demand (Atzori *et al.*, 2010). The internet of things shall be used to connect educational and academic institutions with the industry to transfer the skills and talents need by the new technological revolution.

On the other hand the use of connected devices on campus and in the classroom can allow for automation of time consuming activities like taking attendance and generating students reports as well as grading and quiz generation tasks (Cheng, 2009). The internet of everything can also reduce other costs incurred by schools by monitoring which rooms are vacant and automatically reduce or trunm off the lights or the heating or cooling systems.

By implementing the internet of everything in Education students shall learn faster since they shall use digital highlighters, electronic books, digital search tools, language translators and grammar check tools in addition to Plagiarism detection applications (Cheng, 2009). They shall also use tools to convert their work into different format including PDF and RTF in addition to Word and PPT.

Teachers efficiency: Teachers are one of the main angles of the education triangle. They work hard to make the educational process a success. By implementing the internet of everything in their work, their life shall be easier and they shall produce more efficient results. Today there are tools that help teachers design their curriculum efficiently. Teaching can be conducted online or in a blended setting (Buckley, 2006). Grading syudys and communicating with students or parents is becoming even more easier through the implementation and integration of chat systems and applications over the web and the mobile platforms (Yang and Wu, 2006). The cost

of the use of such technology is becoming lower by the day and many educational institutions are adopting the technology in the classroom.

Learning management systems are making the work of teachers easier than before. Digital content allow for simple sharing of course content with students and colleagues (Buckley, 2006). Collaboration tools help them rely on and build on other peoples knowledge allowing for the knowledge transfer and dissemination among students(Sundmaeker *et al.,* 2010). Internet of everything tools make it easier for instructors to cover more material than in traditional learning sessions. They can link to supporting documents and resources with ease for students to access whenever they choose.

CONCLUSION

The purpose of this syudy was to investigating how the internet of everything can be implemented in the education sector. Our research focused on how the use of the internet of things application is transforming the livers of students and teachers alike and it is generating benefits for schools, universities and educational institutions.

The internet of everything is becoming an everyday reality and is gaining popularity day by day. The technology has been in existence and is used in the healthcare sector and the customer services sectors. Schools as well as universities and colleges are starting to implement the applications of the internet of everything to gain competitive advantage and to survive the information age. The technology shall bring even more advantages to the education sector down the road.

RECOMMENDATIONS

It is our recommendation that educational institutions shall move ahead to maximizing the potential of internet of everything in the educational space in order to provide us with a promising glimpse of the many fields which shall bring about great advantages in the future as long as we stay connected with the online world.

REFERENCES

Akyildiz, I.F., W. Su, Y. Sankarasubramaniam and E. Cayirci, 2002. Wireless sensor networks: A survey. Comput. Networks, 38: 393-422.

Ashton, K., 2009. That internet of things thing. RfiD. J., 22: 97-114.

Atzori, L., A. Iera and G. Morabito, 2010. The internet of things: A survey. Comput. Networks, 54: 2787-2805.

Barakat, S.M., 2012. Implementing an academic research social network: An exploratory study at applied science university. Am. Acad. Scholarly Res. J., 4: 1-4.

Buckley, J., 2006. The Internet of Things: From RFID to the Next-Generation Pervasive Networked Systems. Auerbach Publications, New York, USA.

Cheng, N., 2009. Knowledge sharing and knowledge broker of organizations. Proceedings of the 2nd International Conference on Future Information Technology and Management Engineering, Dec. 13-14, Sanya, China, pp: 195-198.

Yang, H.L. and T.C.T. Wu, 2006. Knowledge sharing in an organization-share or not. Proceedings of the International Conference on Computing and Informatics, June 6-8, Kuala Lumpur, pp: 1-7.

Velusamy, K., D. Venkitaramanan, K.V. Shriram, P. Periasamy and B. Arumugam, 2013. Internet of things in cloud. J. Eng. Applied Sci., 8: 304-313.