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# A Transition Model from Web of Things to Speech of Intelligent Things in a Smart Education System

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## Abstract

Several terms have been used to describe Internet of Things; Web of Things (WoT) is a term which can be used interchangeability and it is referred to as the capability of devices to interconnect to the World Wide Web and sharing the information and data to one another. WoT has been mentioned in the literature to improve interconnection between devices at all times. In WoT, two different modes of communication which are generally mentioned in previous studies include person-to-thing (or thing-to-person) and thing-to-thing. This paper presents an architecture for transiting from WoT to speech-enabled WoT known as Speech of Intelligent Things (SoIT). The system employs a combination of technologies such as system design, server-side scripting, speech-based system tools, and data management in developing the SoIT prototype system as a third mode of communication. This paper illustrates a scenario whereby remote monitoring and controlling of WoT devices within the university campus might be difficult to manage by only using the modes discussed in the literature. An evolution of WoT to SoIT was realized using speech technology to provide a prototype system. Technical implications involve using a telephone by connecting an object telephone number (OTN) and dial WoT objects and establish a control mechanism. The research limitation is mainly the cost of dialing an OTN number. The contribution of this paper is to favor and encourage the use of speech technology to enhance the convenience of communication between WoT devices within the school campus.

## Keywords

e-Campus OTN Speech interface SoIT WoT

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## Notes

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## References

1. 1.

David, N.D.: How the internet of things is revolutionizing healthcare. In: White Paper. Healthcare Segment Manager, Freescale Semiconductor (2013)[Google Scholar](#)

2. 2.

Adamkó, A., Kádek, T., Kollár, L., Kósa, M., Pánovics, J.: New challenges in smart campus applications. In: Recent Advances in Computer Science (2015)[Google Scholar](#)

3. 3.

Royer, M.: The Internet of Things (IoT). A trends white paper—August 2013. Bellevue College Economic & Workforce Development[Google Scholar](#)

4. 4.

Donald, S.: Parking on a Smart Campus: Lessons for Universities and Cities. Published by University of California Transportation Center (2005)[Google Scholar](#)

5. 5.

Rohs, M., Bohn, J.: Entry points into a smart campus environment—overview of the ETHOC system. This work was conducted as part the Entry Points project, which is funded by the ETH World Program (2003)[Google Scholar](#)

6. 6.

Jara, A.J., Ladid, L., Skarmeta, A.: The internet of everything through IPv6: an analysis of challenges, solutions and opportunities. *JoWua* **4**(3), 97–118 (2013)[Google Scholar](#)

7. 7.

Stefanie, T., Christoph, S.: A business model type for the internet of things. In: Research in Progress. 22nd European Conference on Information Systems, Tel Aviv (2014)[Google Scholar](#)

8. 8.

Katole, B., Sivapala, M., Suresh, V.: Principle elements and framework of internet of things. Int. J. Eng. Sci. **3**(5), 24–29 (2013)[Google Scholar](#)

9. 9.

Gubbia, J., Buyy, R., Marusic, S., Palaniswami, M.: Internet of things (IoT): a vision, architectural elements, and future directions. Future Gener. Comput. Syst. **29**, 1645–1660 (2013)[CrossRef](#)[Google Scholar](#)

10. 10.

Rambus: The Internet of Things. How Rambus Sees the Future. 2014 Rambus Inc[Google Scholar](#)

11. 11.

Mattern, F., Floerkemeier, C.: From the internet of computers to the internet of things. In: Distributed Systems Group, Institute for Pervasive Computing, ETH Zurich (2010)[Google Scholar](#)

12. 12.

Abuelyaman, E.S.: Making a smart campus in Saudi Arabia. EDUCASE Q. **31**(2), 10–12 (2018)[Google Scholar](#)

13. 13.

Roman, R., Najera, P., Lopez, J.: Securing the internet of things. Computer **44**(9), 51–58 (2011)[CrossRef](#)[Google Scholar](#)

14. 14.

StaReport: The Internet of Things: Privacy and Security in a Connected World. Staff Report January 2015. A Workshop Hosted by FTC[Google Scholar](#)

15. 15.

IEC: Internet of Things: Wireless Sensor Networks. White Paper (2014)[Google Scholar](#)

16. 16.

Ruggieri, M., Nikookar, H.: Internet of Things: From Research and Innovation to Market Deployment. Rivers Publisher's Series in Communication (2014)[Google Scholar](#)

17.17.

Ravikanti, S., Preeti, G.: Future's smart objects in IOT, based on BigData and cloud computing technologies. *Int. J. Innov. Res. Comput. Commun. Eng.* **3**(7), 6808–6817 (2015)[CrossRef](#)[Google Scholar](#)

18.18.

Azure, M.S.: Get Started with the Internet of Things in Your Organization. Introducing Microsoft Azure Internet of Things services. Executive Summary. © 2015 Microsoft Corporation[Google Scholar](#)

19.19.

IBM: Saving the future of the IoT. IBM Institute of Business Value. Device Democracy (2005)[Google Scholar](#)

20.20.

Barcena, M.B., Queest, C.: Insecurity in the IoT. Candid Wueest, Version 1.0 (2015)[Google Scholar](#)

21.21.

Azeta, A.A.: Developing A computerized VoiceXML-based application for E-education: design, implementation and evaluation. Lambert Academic Publishing, Germany (2013)[Google Scholar](#)

22.22.

Nati, M., Gluhak, A, Abangar, H., Headley, W.: Smartcampus: a user-centric testbed for internet of things experimentation. In: IEEE WPMC (2013)[Google Scholar](#)

23.23.

Voxeo: Voice voice server, available online at: <http://community.voxeo.com> (2003)

24.24.

Rieman, M.F.J., Redmiles, D.: Usability evaluation with the cognitive walkthrough. In: CHI '95 Proceedings, ACM (1995)[Google Scholar](#)

25.25.

APKM: Smart Campus Guidelines-Draft. APKM—Smart Campus Draft Version 123/05/2015[Google Scholar](#)

26.26.

Esaki, H.: Smart Campus Implementation Based on Internet-by-Design. Green University Tokyo Project. Internet Society (2015)[Google Scholar](#)

27.27.

Azeta, A.A., Igbekele, E.O., Azeta, V.I.: Moving from Web-of-Things to Voice-of-Intelligent-Things in e-Campus. In: AFRICON, 2017 IEEE. IEEE (2017)[Google Scholar](#)

28.28.

Nuance: <http://www.nuance.com>, 2002, as of 15 March 2002

29.29.

SpeechWorks: <http://www.speechworks.com>, 2002, as of 15 March 2002

30.30.

TellMe: <http://www.tellme.com>, 2001, as of 15 March 2002

31.31.

Beck, J.E., Jia, P., Mostow, J.: Automatically assessing oral reading fluency in a computer tutor that listens. *Technol. Instr. Cognit. Learn.* **2**, 61–81 (2004)[Google Scholar](#)

32.32.

Rickel, J., Johnson, W.L.: Task-oriented collaboration with embodied agents in virtual worlds. In: Cassell, J., Sullivan, J., Prevost, S., Churchill, E. (eds.) *Embodied Conversational Agents*, pp. 95–122. MIT Press, Cambridge (2000)[Google Scholar](#)

33.33.

Iera, A., Morabito, G., Atzori, L. (eds.): *The Internet of Things*. Springer, Berlin (2010). ISBN: 978-1-4419-1673-0 [zbMATH](#)[Google Scholar](#)

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