Smartphones, Cloud Computing and Apps - Green Game Changers for Measurement Science and Education

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Abstract. *Aim of the paper is to show innovative game changers for measurement science and education, instrumentation and training. Smartphones, cloud computing and apps open new opportunities for measurement science and education. Smartphones are in principle powerful computers. Cloud computing is the innovative technical infrastructure for knowledge acquisition, transfer and application. It is convenient, reliable and affordable. Apps are a new kind of software modules for direct specialized applications. They are reducing the complexity of universal software packages and facilitate an application for everyone. Personalized web competence matrices are new tools for mobile scientific work and education in real-time.*

Keywords: Smartphones, Cloud Computing, Apps, Measurement Science, Measurement Education, Instrumentation, Training, Green Measurement

1. Introduction

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2. State of the Art in Computers

Days before yesterday standard computers have been main frames and process computers. They have been big, expensive and functionally poor. The next era was characterized by desktop and laptop computers. With laptops the era of mobile and outdoor applications have been started, although to a certain extend inconvenient and expensive. Today the functionality of laptops is equipped in the dimensions of smartphones (Fig. 1.). Smartphones are commodities with a huge dissemination worldwide. Big numbers of smartpads are at the dawn.

3. State of the Art in Computing and Applications

Cloud computing is currently one of the most significant topics of the further development of information and communication technologies for producers and customers. Cloud computing is an innovative challenge for digital products and services. Till now only the top of the iceberg is seen. During the last years, mobile smartphones became commodities for cloud computing and apps. Their biggest advantages are convenience, reliability and affordability (Fig. 2.). Apps are innovative tools to reduce the complexity of bigger software packages. The worldwide mobile availability of smartphone, the ease in dealing with cloud computing and apps and the worldwide possibility of cashless payment for apps is an enormous drive for the development of permanently new or improved software apps in any fields.

4. Fundamental Tasks of Measurement Science and Education

The competent handling of digital information and communication media becomes a fundamental role in everyday life. Particularly encouraging is the innovative role of the internet for measurement science and education. Fundamental tasks of measurement science are to discover new relationships in measurements and to generalize new knowledge for measurements. Fundamental tasks of measurement education are to educate young specialists for measurements and to re-qualify measurement people at work and at home (Fig. 3.). The promotion of measurement science and education via internet is an innovative means for convenient, reliable and affordable collaborations to share standpoints, to harmonize issues and to unify doctrines [1].

5. Innovative Capabilities of Measurement Instrumentation and Training

The innovative capabilities of measurement instrumentation are characterized by measurement value acquisition and processing with smartphones. Also especially in mobile measurement education and training powerful smartphones are the enabler of innovative capabilities (Fig. 4.). The practical training gets innovative boundary conditions for more freedom in volume, time and place concerning exercises with real measuring tools or with their simulators. The instrumentation and training can be supported by see see & click manuals (SSC-manuals) with complete user guiding and a guaranteed success for the measurement procedure [2].

6. Personalized Web Competence Matrices for Science and Education

Smartphones and cloud computing are modern enabler for real-time transfer and personalized traceability of scientific publications, lectures, podcasts, webinars, trailers and videos (Fig. 5. and Fig. 6.). Personalized web competence matrices are the very beginning of a new understanding of collaboration in measurement science and education in a more “green” way – convenient, reliable and affordable – every time and everywhere – and in an increasing number of automatic translated languages [3].

7. Conclusions

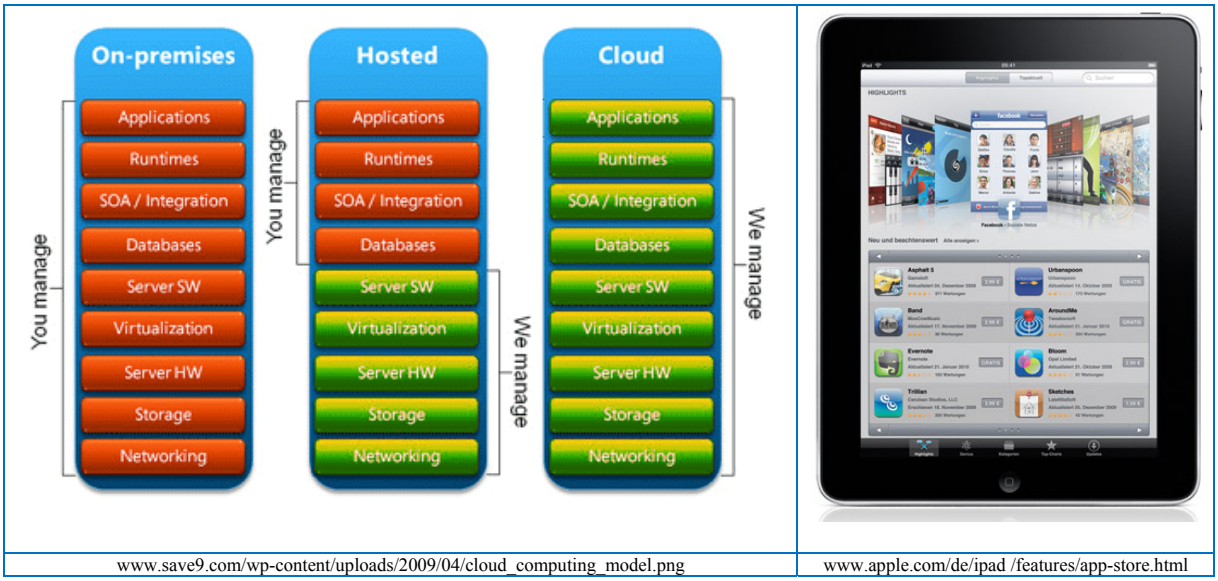
Aim of the paper was to demonstrate, that smartphones, cloud computing and apps are modern enabler for mobile real-time transfer of measurement information, for personalized collaboration and for easy traceability of scientific publications, lectures, podcasts, webinars, trailers and videos. They are fundamental game changers for measurement science and education, instrumentation and training in an innovative "green" way.

References

[1] http://www.spectronet.de
[2] http://spectronet.de/de/akademie/qualifizierung-training---steinbeis--transfe_gcarq6pi.htm
[3] http://www.greenvision.spectronet.de

today	yesterday	days before yesterday

Fig. 1. Evolution of computers



www.save9.com/wp-content/uploads/2009/04/cloud_computing_model.png	www.apple.com/de/ipad /features/app-store.html

Fig. 2. From on-premises computing to cloud computing and apps.

Fig. 3. Fundamental tasks of measurement science and education.

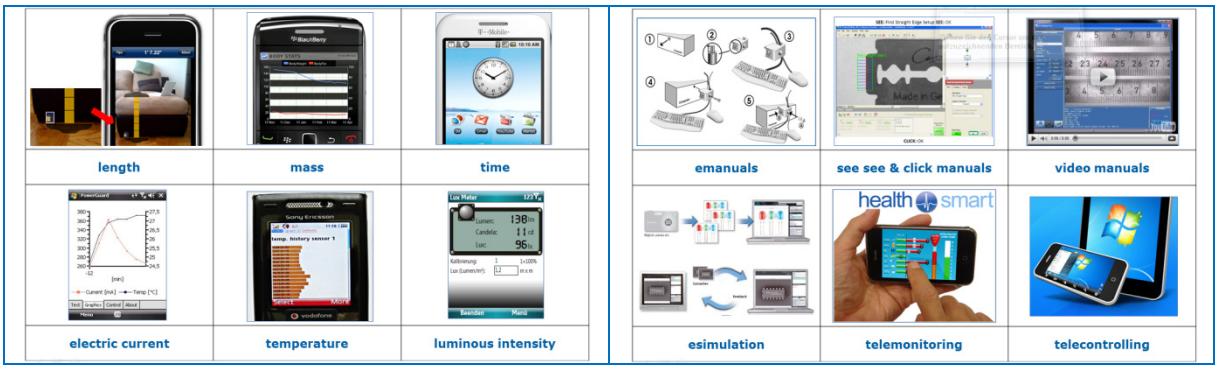


Fig. 4. Innovative capabilities of measurement instrumentation and training.

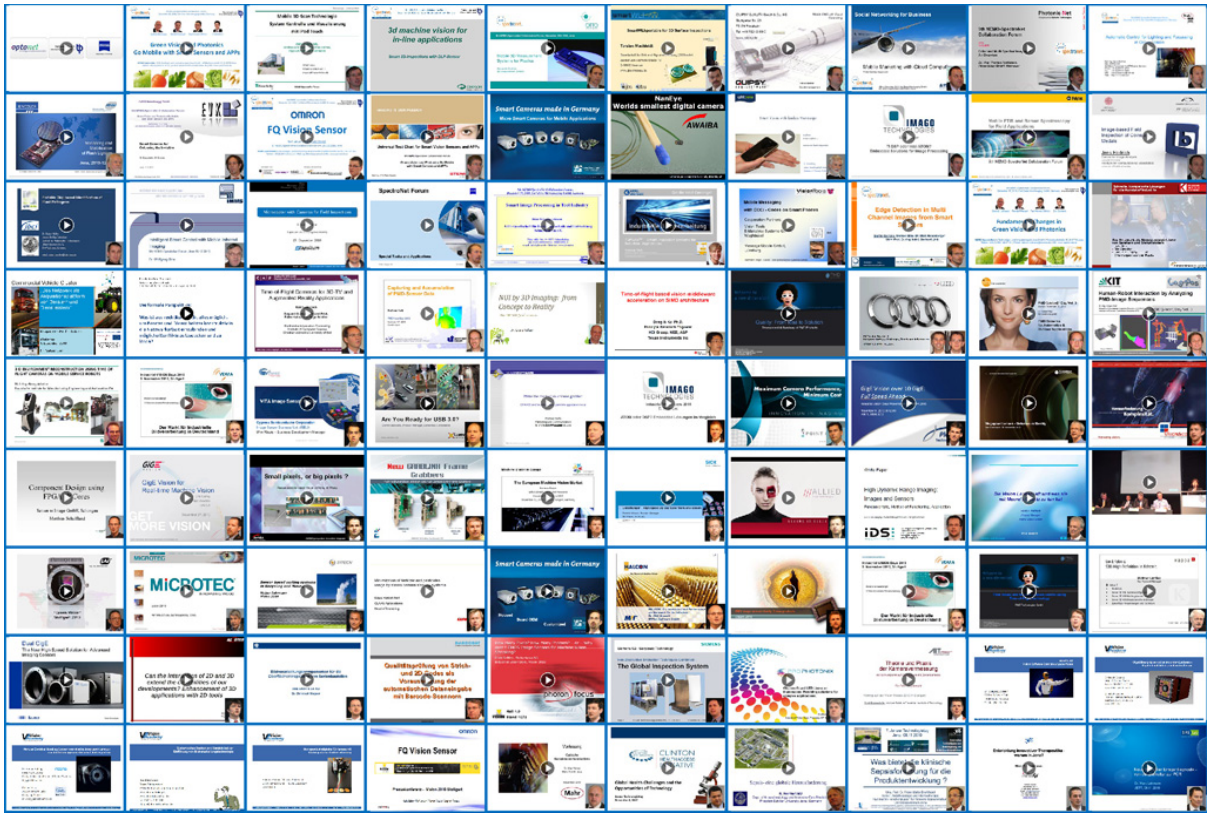


Fig. 5. Personalized web competence matrices for science and education.

Lecture	Webinar	Hands-on Training
SPIE/IS&T Symposium	NEMO-Tag des BMWi	STEMMER-IMAGING
Dr. Bernice E. Rogowitz	RD Dr. Dieter Belter	Dipl.-Ing. Lars Fermum

Fig. 6. Details of web lectures, webinars and hands-on trainings.