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## Intelligent situational awareness powered by internet of things and human-centered recommender systems

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The increasing uncertainty of the business environment and complexity of high operational tempo has increased the demand for timely, accurate and ease of use information. However, a range of challenges are currently present.

- a) Each enterprise relies on several desperate IT systems which have limited interoperability.
- b) Relevant information could emerge from thousands of data sources (particularly in wireless and mobile environment), making data capture, storage and analysis difficult.
- c) Too much data and information makes decision making difficult, even for Data Expert.

This keynote presents emerging technologies for just-in-time human-centred recommender system and its application to logistics network situation awareness powered by Internet of Things – where simplified data-set and decision support are given through automated data usage and decision mining processes and in real time. This keynote introduces the framework for real time massive data mining and predictive analytics. We demonstrate this through predictive situation context and situation aspect analytics and the intelligent situation awareness platform. We also present the comparison of 40 years of data mining technologies, and an overview of the state-of-the-art recommender systems, viability of “plug n play” functions for any enterprise systems. Finally, we present our statistics of end-users stresses with guided analytics and self-service BI. This is followed by the illustration on the need for moving forward from data visualization to recommender systems, to reduce temporal and cognitive load of the human users, decision makers or data expert.

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## Micro-converter with remotely coupled DC power

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Microsystems are rapidly making their avenue into commercial applications. Power needs to be supplied to individual devices without requiring wires or physical tethering if the full potential of the micro-machines are to be realized. We develop direct DC power for micro-devices using remote radio-frequency (RF) generation as well as on-chip RF to DC micro-converter. The micro-scale antennas will supply as much as 10 mW of DC power in an area less than 20 mm x 20 mm. Optical coupling may not be required because the RF energy can be penetrated into the system without significant loss of energy through media. Fabrication of working remotely powered micro-chips is being developed. This technology may realize power converter for individual micro-robots, micro-probes as well as wireless power distribution to multi-chips and micro-scale energy storage devices such as batteries.

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