



POLITÉCNICA



Universidad  
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ETSI SISTEMAS  
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# Máster en Ciencias y Tecnologías de la Computación

## Doctorado en Ciencias y Tecnologías de la Computación para Smart Cities

Curso 2014-15

### Seminarios de Investigación

#### 2º seminario:

**Título:** Demystifying Big Data Adoption: Paradigm shifts and Complexity Tolerance Theory

**Conferenciante:** Hong-Mei Chen

**Fecha:** 3 de diciembre de 2014

**Lugar:** Sala de Grados (ETS de Ingeniería de Sistemas Informáticos)

**Hora:** 19:00

**Descripción:** The big data phenomena is unprecedented: 90% of all data in the world has been created in the past 2 years and the volume is doubling every 1.5 years. The need to process various data types (structured, semi-structured, unstructured) exceeds the capacity of traditional relational database management systems. Real time analytical processing is becoming a requirement for modern business intelligence applications. Technologies (open source or proprietary; software, firmware, appliances) to store, process, and extract value from big data are offered at an ever-increasing speed that challenges and perplexes modern enterprises. For instance, there were 37 NoSQL open source products in the market in Oct. 2013. There were in excess of 150 products in the market as of Oct. 2014. The big data market is fluctuating with respect to SQL technology, going from SQL to NoSQL, and then back to NEWSQL. New analytical platforms are emerging to replace less than one-year old predecessors. Facing the technical complexity and rapid changes of big data technology, there have been reports that 50% of the big data projects had failed as of 2013.

Amidst the big data hype pushed by the technology vendors and the unexpectedly low adoption rate, this seminar aims to clarify the myths about big data and to offer research directions. We will first define big data, present 10 paradigm shifts in big data management, identify new market trends, and then discuss the results of an empirical study of 12 large international European companies (average number of employees > 150,000 people). Our exploratory multi-case study shed light on the interaction effects of paradigm shifts, IT fashion, relative advantages, and competitive pressures on the complexity tolerance of enterprises which leads to adoption or non-adoption of big data technologies. We report how, in practice, an enterprise's

complexity tolerance was increased by complexity reduction and isolation strategies. The present study contributes to firm-level technology adoption and innovation theories as well as providing understanding of big data adoption in practice, contrasting B2B with B2C companies. Research directions for reducing complexity of big data management are recommended.

Madrid, a 29 de noviembre de 2014

Fdo.: D. Jesús García López de Lacalle  
(Coordinador de la asignatura)