

# Data Science Competences to Understand Big Data Analysis from a Management Perspective

- a Top Down View -

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EGI Community Forum

“Industry Demand of Data Science from a Management  
Perspective“

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EDISON – Education for **D**ata Intensive  
Science to **O**pen **N**ew science frontiers

Grant 675419 (INFRASUPP-4-2015: CSA)



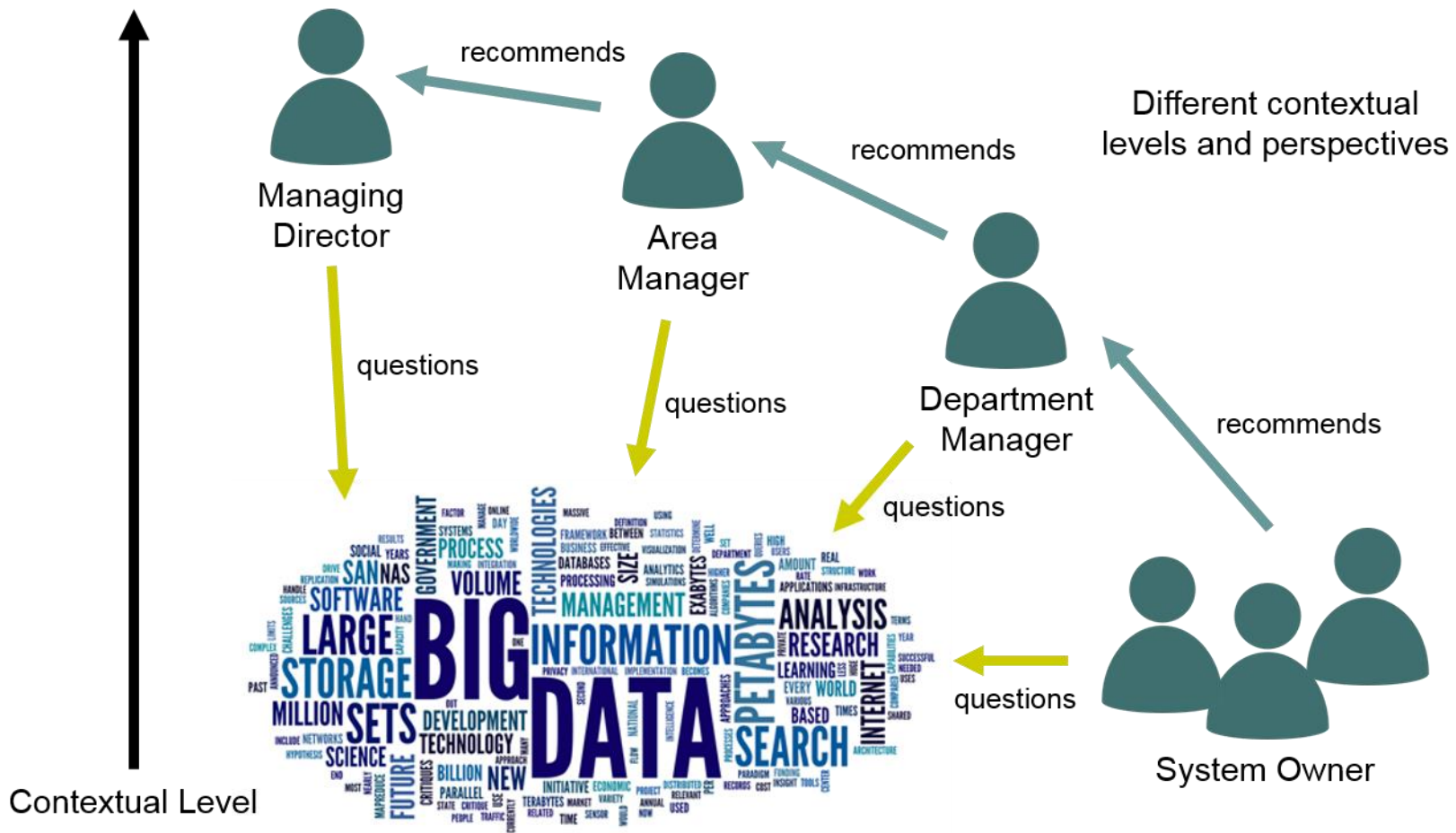
# Personal Background

- University
  - 02/2010 – 08/2011: Information Technology (Mannheim University of Applied Sciences)
    - Master Thesis: Situation Based Sensor Fusion for Mobile Robots (Institute of Software Development and Data Communication)
  - 09/2006 – 02/2010: Applied Computer Science (Mannheim University of Applied Sciences)
    - Bachelor Thesis: Acquisition and Statistical Evaluation of EpiCode and ClusterCode in the Manufacturing Chain of Folding Cardboard Boxes in Offset Printing (Institute of Digital Signal Processing)
- Industry
  - 11/2014 – today: Department Head Server Rooms DACH, Integration & Performance Management (Bilfinger Global IT GmbH)
  - 11/2014 – today: Capacity, Availability & Continuity Management Specialist (Bilfinger Global IT GmbH)
  - 10/2012 – 10/2014: IT Project Manager (Bilfinger SE)
  - 10/2011 – 09/2012: Trainee IT Infrastructure / Security (Bilfinger SE)



# Big Data Perspectives in Industry

## Knowledge Management and Decision Structure





# Big Data Perspectives in Industry

## Knowledge Management and Decision Structure

- Managing Director
  - Global perspective and highest contextual level
  - Business development, global resource planning, market challenges, etc.
- Area Manager
  - High perspective and high contextual level
  - Customer development, service level quality, etc.
- Department Manager
  - Medium perspective and medium contextual level
  - Running costs, resource planning, etc.
- System Owner
  - Low perspective and low contextual level
  - System state, health checks, etc.



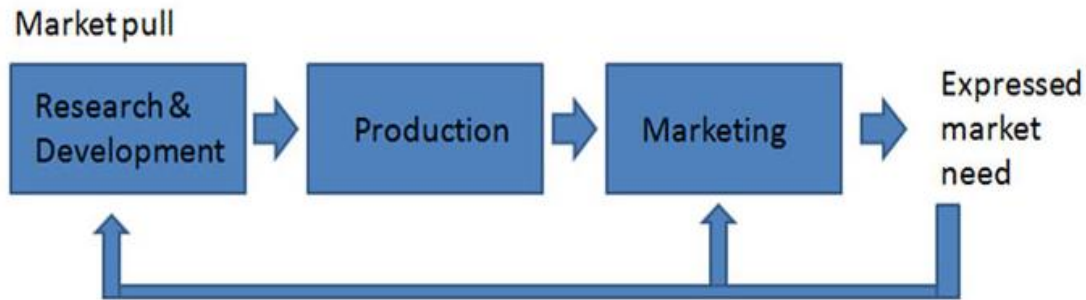
→ **Big Data analysis is based on different perspectives and their intentions.**



# Big Data Perspectives in Industry

## Business Intelligence as a Managerial Application Domain

- Industry needs Business Intelligence
  - Innovation strategies, competitiveness, strategic positioning, service optimization, etc.



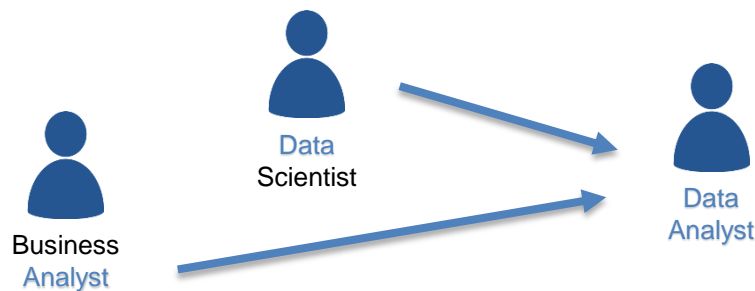
Market Orientation “Market Pull” (W. E. Scouder 1989)

- Big Data analysis can support Business Intelligence
    - Turn raw, low-level data into actionable knowledge
    - Uncover hidden patterns, unknown correlations and other useful information
- Business processes built on Big Data analysis processes.



# Role of Data Scientists in Industry

- Management Functions in Industry needs Business Analysts
  - Big Data consumers in Business Intelligence scenarios **have to perceive and understand** what Big Data analysis result stand for, without an understanding of Big Data itself.
  - An organizations' technical ability for Big Data analysis, does not automatically result in human resources for Big Data analysis.

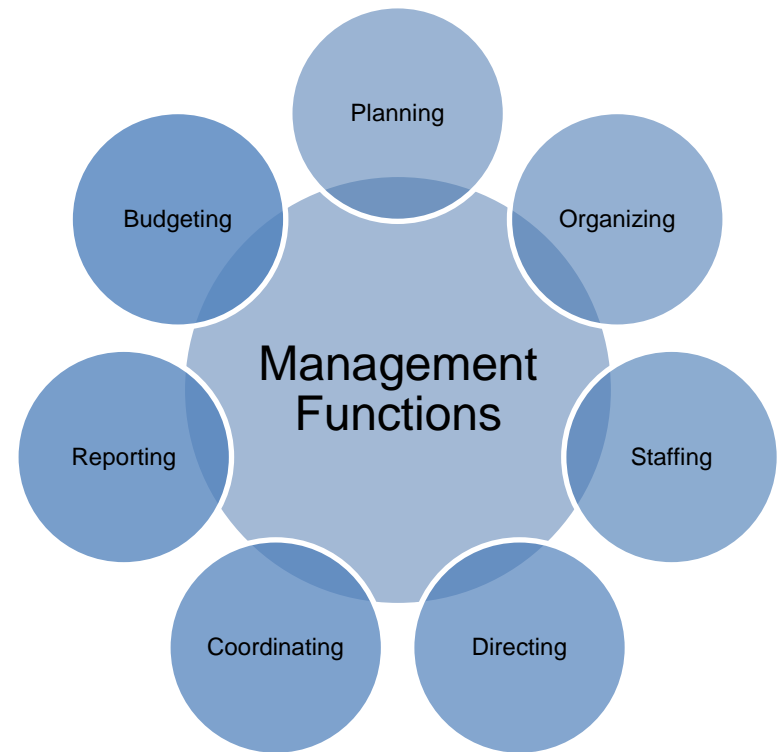


- Data Analysts are filling the gap between Big Data consumers and Big Data technologies.
- Data Analysts need a technical understanding of Big Data as well as a professional understanding of their customers contextual levels and perspectives.



# Data Analyst Competences to Support Management Functions in Industry

- The ability to make sustainable decisions is a required core competence for every Management Function.
- Data Analysts need to understand their customers intentions support this decision process as well as a strong technology watch.
- Data Analysts are not the same like developers, because they care about having impact on the business.
- Social Skills (creativity, flexibility, etc.) as well as technical know-how are important to support different Management Functions.



**POSDCoRB** (Luther Gulick 1937)



# Data Analyst Competences to Support Management Functions in Industry



## Management Functions

planning, organizing, staffing, directing, coordinating, reporting and budgeting



## Social Skills

creativity, diversity, self-assurance, eloquence and flexibility



## Technical Competences

data mining, analytics, information visualization, communication, statistics, engineering and computer science [EU15]

Industrial Requirements for Data Analysts





# Summary of Data Analyst Competences to Support Management Functions in Industry

- Data Analysts...
  - are filling the gap between Big Data consumers and Big Data technologies.
  - need a technical understanding of Big Data as well as a professional understanding of their customers contextual levels and perspectives.
  - need to understand their customers intentions to support the decision process of management functions as well as a strong technology watch.
  - are not the same like developers, because they care about having impact on the business.
- Data Scientists' education must be based on more than "just technology".
- Industry often fills this existing gap with specialized Trainee Programs to enrich the qualification of graduates.



# Thank you for your Attention

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# Backup

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# References

- [EU15] European Commission: Education for Data Intensive Science to Open New science frontiers. In: H2020-INFRA-SUPP-2015-1, Proposal number: 675419, Proposal acronym: EDISON (2015)
- [Gul37] Gulick, L. 1937. Notes on the theory of organization. In L. Gulick and L. Urwick (Eds.), Papers on the Science of Administration, pp. 1–89. New York: Institute of Public Administration.
- [Pra13] Prajapati, Vignesh: Big Data Analytics with R and Hadoop. Packt Publishing, 2013. ISBN 9781782163282
- [Sco89] W. E. Scouder, “Improving Productivity through Technology Push,” Research Technology Management, Vol. 32, No. 2, 1989, pp. 19-31.
- [Upa13] Upadhyay, Shashi ; Grant, Rebecca: 5 data scientists who became CEOs – and are leading thriving companies. In: Venturebeat (2013)
- [XSZ+15] Xu, Xiaofei ; Sheng, Q.Z. ; Zhang, Liang-Jie ; Fan, Yushun ; Dustdar, S.: From Big Data to Big Service. In: Computer 48 (2015), July, Nr. 7, S. 8083. ISSN 00189162



# POSDCoRB Management Functions

- **Planning:** working out in broad outline the things that need to be done and the methods for doing them to accomplish the purpose set for the enterprise.
- **Organizing:** Establishment of the formal structure of authority through which work subdivisions are arranged, defined, and coordinated for the defined objective.
- **Staffing:** Whole personnel function of bringing in and training the staff and maintaining favorable conditions of work.
- **Directing:** Continuous task of making decisions and embodying them in specific and general orders and instructions and serving as the leader of the enterprise.
- **Coordinating:** All important duty of interrelating the various parts of the work.
- **Reporting:** Keeping those to whom the executive is responsible informed as to what is going on, which thus includes keeping himself and his subordinates informed through records, research, and inspection.
- **Budgeting:** All that goes with budgeting in the form of planning, accounting and control.



# Discussion

