

Big Data – Big Business ? / !

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Leiden Institute of Advanced Computer Science (LIACS)
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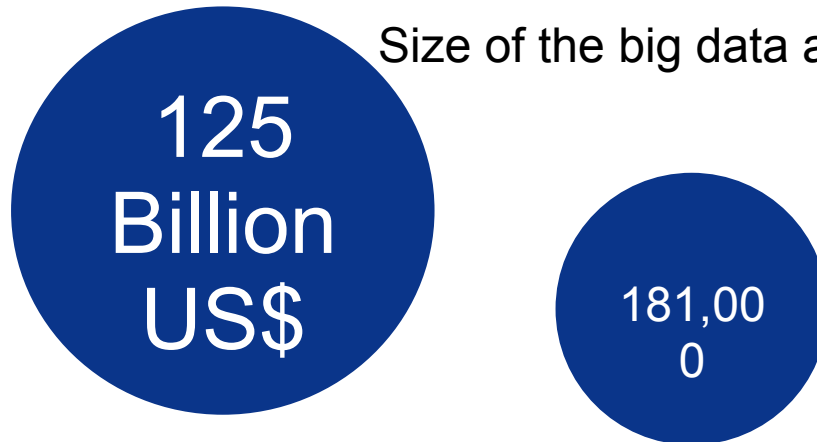


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Some Findings

Size of the big data and analytics market in 2015



Shortage of skilled staff will persist. In the U.S. alone there will be 181,000 deep analytics roles in 2018 and 5x that many positions requiring related skills in data management and interpretation.

Visual data discovery, an important enabler of end user self-service, will grow 2.5x faster than the rest of the market, becoming by 2018 a requirement for all enterprises.

Storytelling will be the hot new job in analytics

The most important attribute sought in candidates for big data analytics jobs is communications skills. As organizations run into obstacles in understanding and adopting analytics, they rightly place more emphasis on communication, which is not a strength of most analysts.

Source: <http://www.forbes.com/sites/gilpress/2014/12/11/6-predictions-for-the-125-billion-big-data-analytics-market-in-2015/>

Some Findings (Forbes)

89% believe that companies that do not adopt a Big Data analytics strategy in the next year risk losing market share and momentum.

89
%

87%

87% of enterprises believe Big Data analytics will redefine the competitive landscape of their industries within the next three years.

The study also shows that many enterprises are investing the majority of their time in analysis (36%) and just 13% are using Big Data analytics to predict outcomes, and only 16% using their analytics applications to optimize processes and strategies. Moving beyond analysis to predictive analytics and optimization is the upside potential the majority of the C-level respondents see as essential to staying competitive

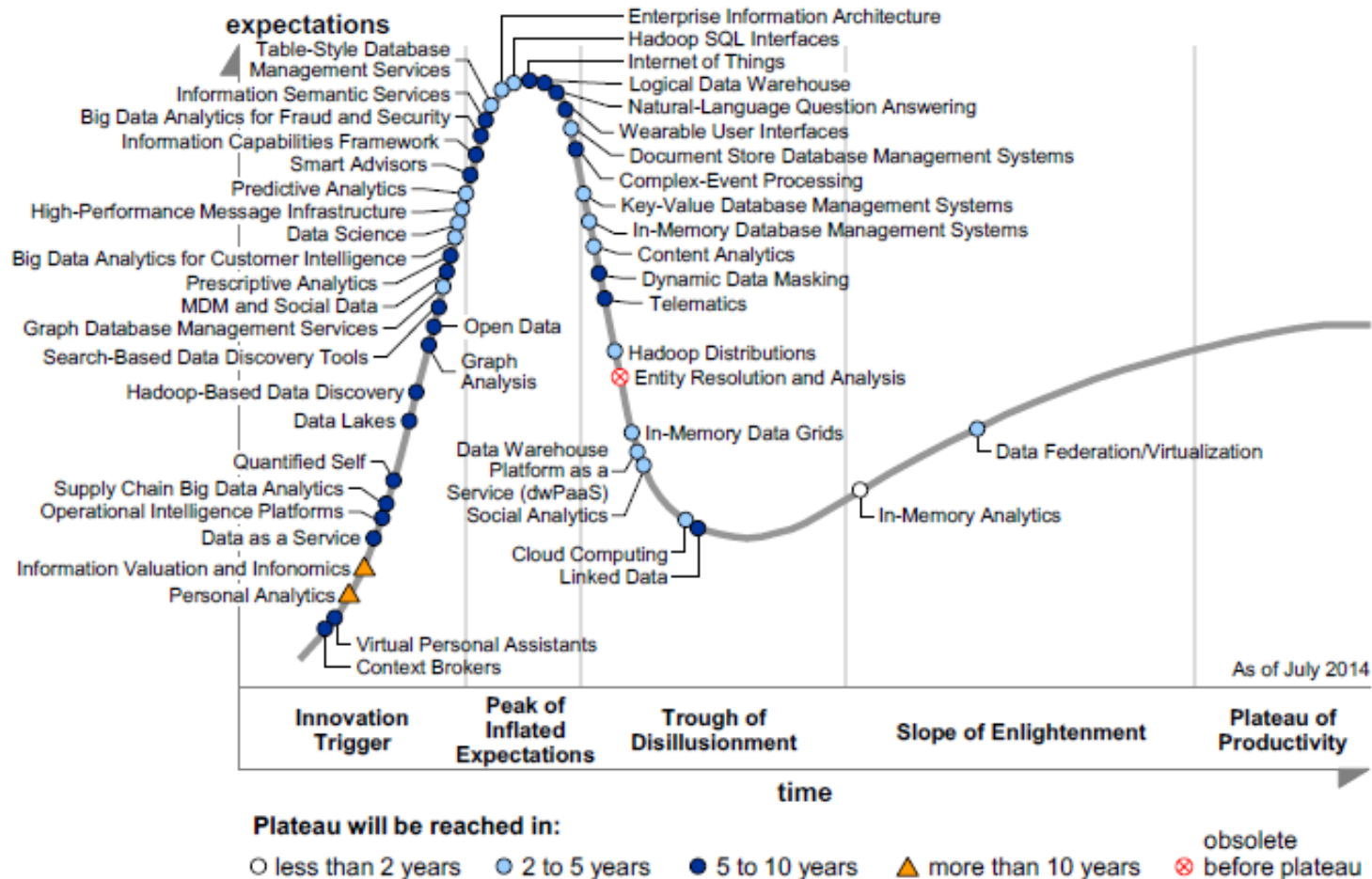
The Industrial Internet is projected to be worth \$500B in worldwide spending by 2020, taking into account hardware, software and services sales

500 Billion
US\$

Source: <http://www.forbes.com/sites/louiscolombus/2014/10/19/84-of-enterprises-see-big-data-analytics-changing-their-industries-competitive-landscapes-in-the-next-year/>

Hype-Cycle, © Gartner

Figure 1. Hype Cycle for Big Data, 2014



Source: Gartner (August 2014)

Just one Business Example



■ ■ ■

Given historical data and assumptions:

- Predict demand for travels
- Forecast supply chain from planning to control
- 40,000 travel products, twice a year

Results:

- Forecasting error very low (< 5%)
- Outperforms human experts
- All planning, pricing, etc. based on this technology now

Executive Strategy

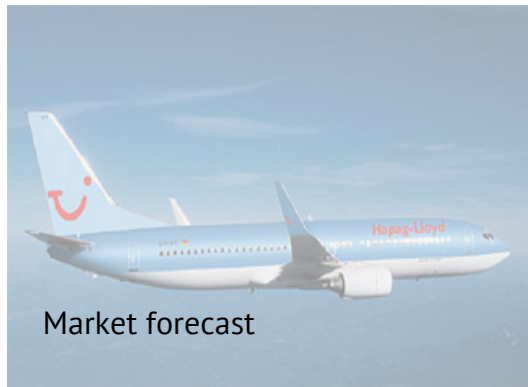
- Segment Planning
- Fleet Planning

Operational Strategy

- Flight Planning
- Product Planning

Operational Control

- Disposition
- Control



Market forecast



Detail planning & forecasting Projection



Flight Prognosis System Projection

3 years

12 months

Booking starts

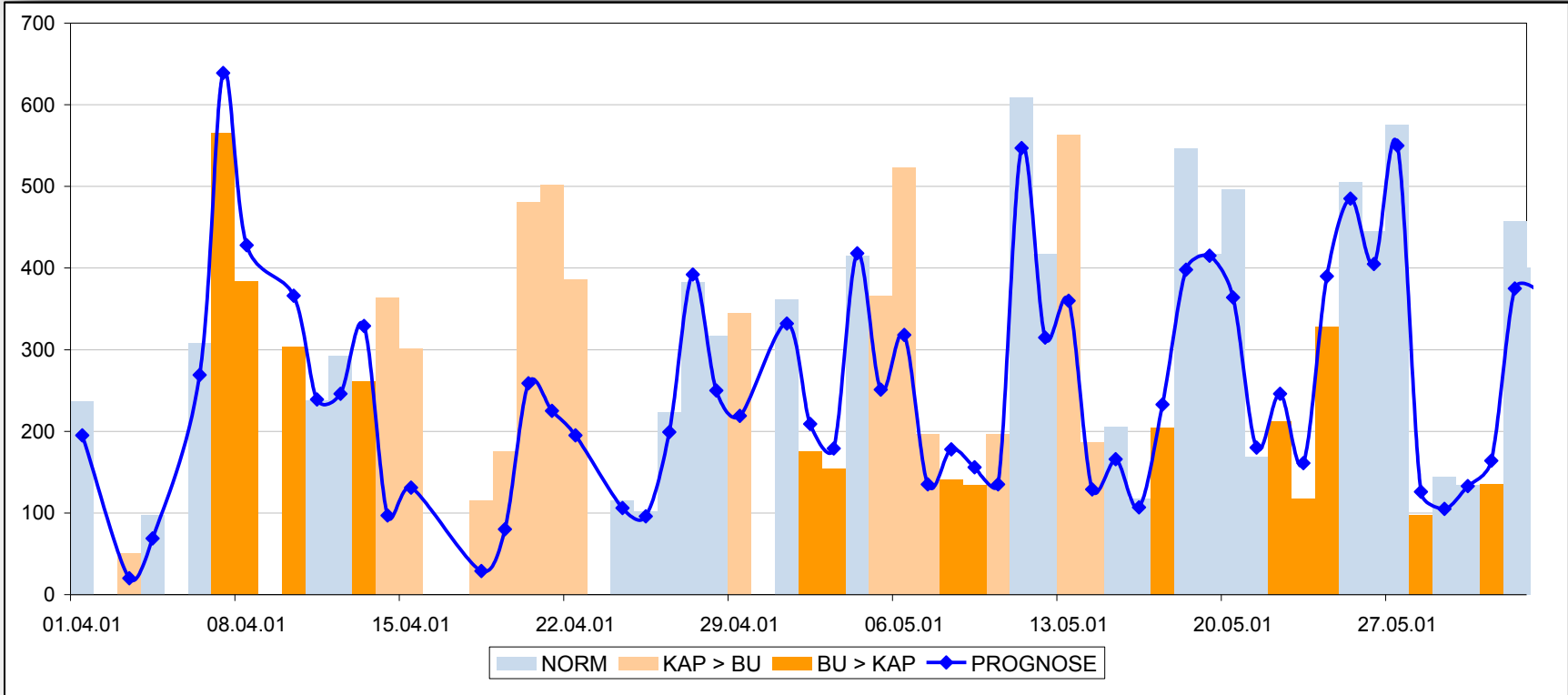
Start itinerary

Forecasting Tool



World of **Yellow-Pages** **RELATIONS-SICHT**

ABFH: ZFH: VON: BIS:



DAMIOSO



- PI: Thomas Bäck, UL
- Co-PIs:
 - Joost Kok, UL
 - Stefan Manegold, CWI
 - Lars Gräning, HRI

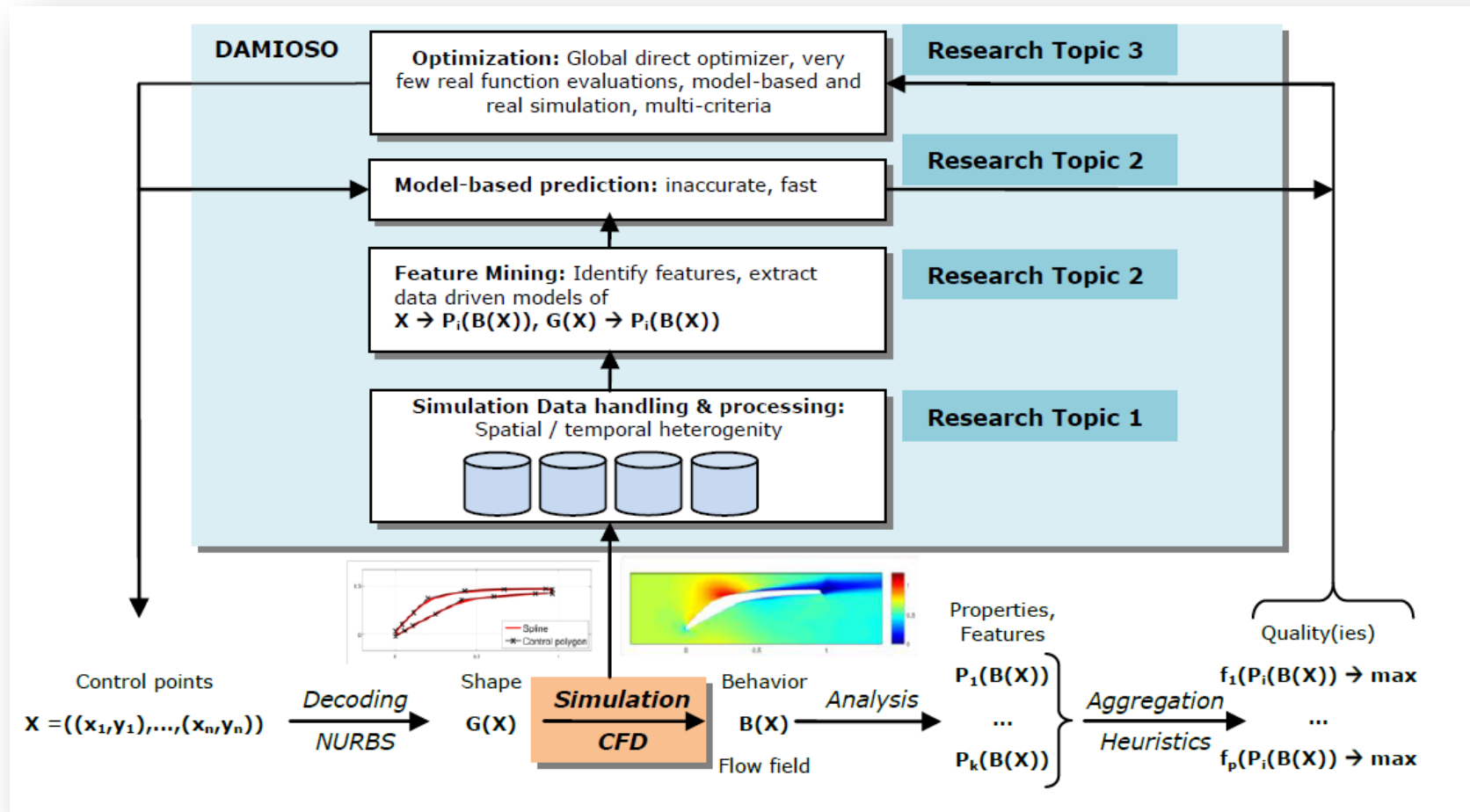


The DAMIOSO project focuses on developing algorithms and tools for managing, mining, learning and optimization based on the massive volume of data generated by modern simulation tools used in a wide range

- 3 PhDs, 1/2 PostDoc
- Advisory board:



DAMIOSO: Approach



Core: Simulation (CFD), feature mining, optimization

PROMIMOOC

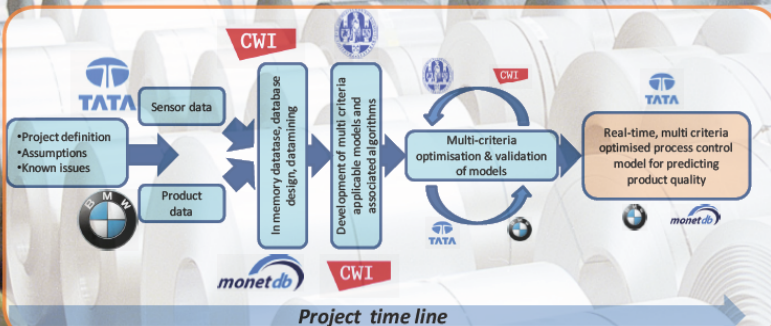
Process Mining for Multi-Objective Online Control

The Leiden Institute of Advanced Computer Science (LIACS) received a grant award from NWO for a joint proposal with Centrum Wiskunde & Informatica (CWI, Amsterdam), Tata Steel (IJmuiden), BMW (Munich) and database company MonetDB. Within the NWO Data Science program "Challenging Big Data", LIACS is engaged in a four-year project aimed at developing a new system for controlling and optimising industrial production processes.

In general industrial processes are monitored by many sensors, which typically generate huge volumes of non-standardised multi-dimensional data, both numeric and images. In practice a large proportion of this data is not used to the fullest. This project will use historic and on-line process data to develop predictive process models for real-time optimisation of production processes. This optimisation takes place along multiple competing objectives, most of them being quality criteria.

The benefit for the companies involved is to enable them to produce higher quality end products with less downtime, thereby minimising waste and loss of productivity. With Tata Steel and BMW the process chain represents steel production and steel forming, from a producer's as well as a consumer's perspective. LIACS, CWI and MonetDB contribute the big data storage and processing, data mining and data driven modelling, and optimization and multiple criteria decision making expertise.

The principal investigators involved are Prof. dr Thomas Bäck at LIACS, Dr Stefan Manegold at CWI, Kees Jonker at Tata Steel, Arnulf Lipp at BMW and Prof. dr Martin Kersten at MonetDB.



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