Economics, management and computer science

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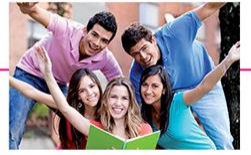
Economics, Management and Computer Science

- Globalization and increased connectiveness make available to citizens, to corporations and scientists an amount of data unthinkable a few years ago
- http://www.webpagefx.com/internet-real-time/

- The amount of information and quantity of data that mankind has generated in the first months of this year are bigger than the quantity it has generated in the past century
- Increased connectivity is changing the way we work and communicate

- Our increased connectivity is changing the way in which we live, the way in which personal relations are shaped, the way in which corporations operate and the way in which government and institutions work and communicate with citizens

- We register a large increase in the use of computers in everyday life, with new societal phenomena, entrepreneurial opportunities and new professions
- A data driven economy is awaiting us and an adequate skill basis is needed to turn the new opportunities into successful careers



Economics, Management and Computer Science

- Communication of the EC to the European Parliament, July 2 2014
- Several players to create added value from the availability of big data
- EC document on cloud computing: big data and correlated services will reach 16,9 billion USD value in 2015, with an average growth rate of 40%, seven times higher the rate of growth of technology market
- In the UK number of big data specialists working in big firms will increase by 240% (Source: SAS report)
- EU Grand Colation for Digital Jobs

EU Document

- *An adequate skills base:* The competence base addresses descriptive and predictive data analytics, data visualisation, artificial intelligence and decision-making software tools and algorithms.
- The EU document encourages *close cooperation between players* (i.e., industry and universities) to achieve the sharing of the desired competences
- *The training of* professionals who can perform in-depth thematic analysis, exploit machine findings, derive insight from data and use them for improved decision-making is considered crucial.

Main Goals

- To comprehend the strategic implications for private and public institutions of the new “data driven” economy

- To understand how to govern the changes induced by information technology in the way we model and solve the new problems of economics and management

What is Big Data?

Big Data is high-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making (Source: Gartner)

The incredible amount of information and data generated by new technologies can bring **competitive advantages** for companies and institutions.

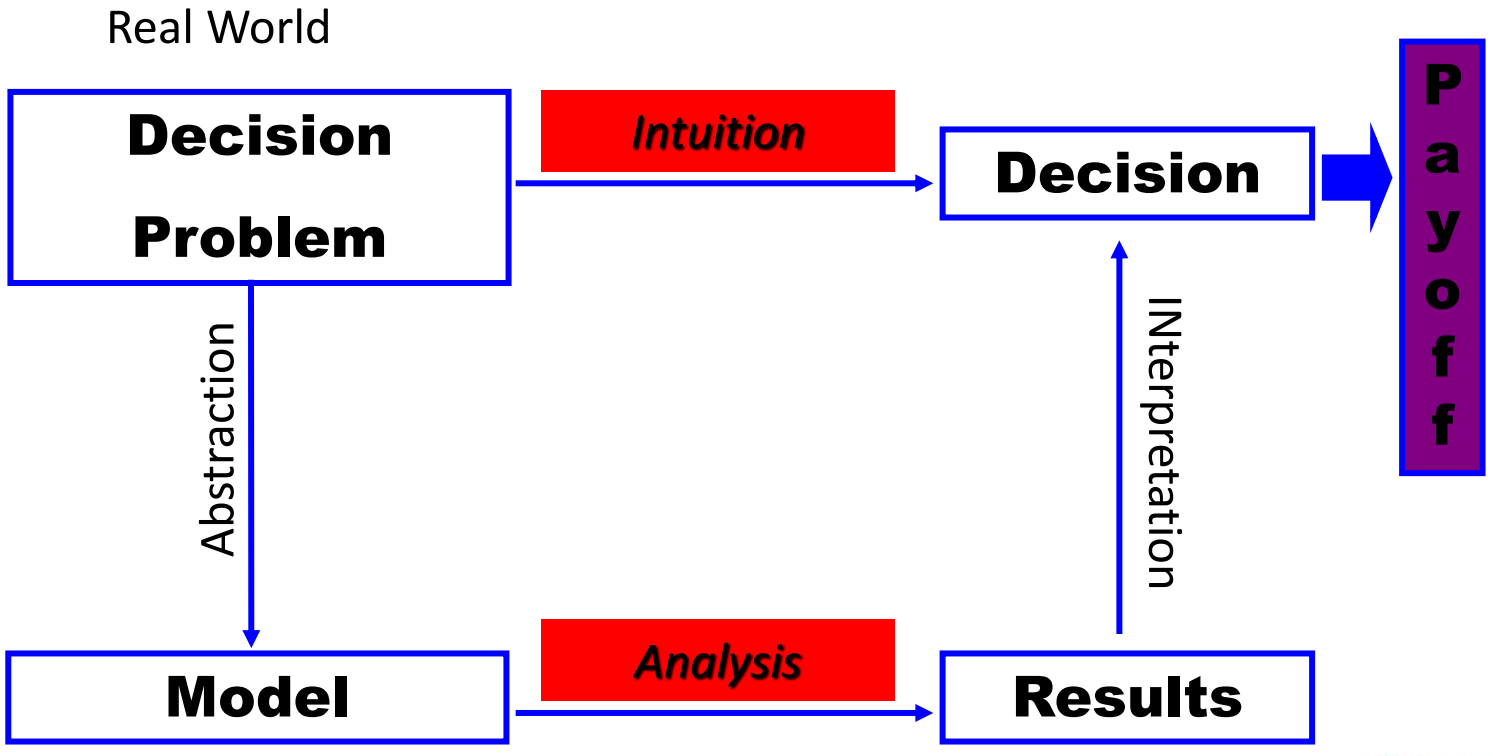
There is a specific **demand for new professional roles** such as Data Scientists and Business Analysts. They have:

- the technical skills to **gather and manage** data
- the ability to **interpret** data through the lens of economic models, thus enabling them to provide credible support to company decision making.

Big Data Application Fields: Some Examples

- City traffic
- Revenue Management
- Online Forecasts
- Political elections
- Personalized advertising
- Purchasing recommendations
- Cross selling
- Online Auctions
- Geolocalization
- Healthcare/medical research
- Fraud detection

The Modern Decision Making Process



A Quote

By modeling various alternatives for future system design, Federal Express has, in effect, made its mistakes on paper. Computer modeling works; it allows us to examine many different alternatives and it forces the examination of the entire problem.

Frederick W. Smith
Chairman and CEO of Federal Express Corporation

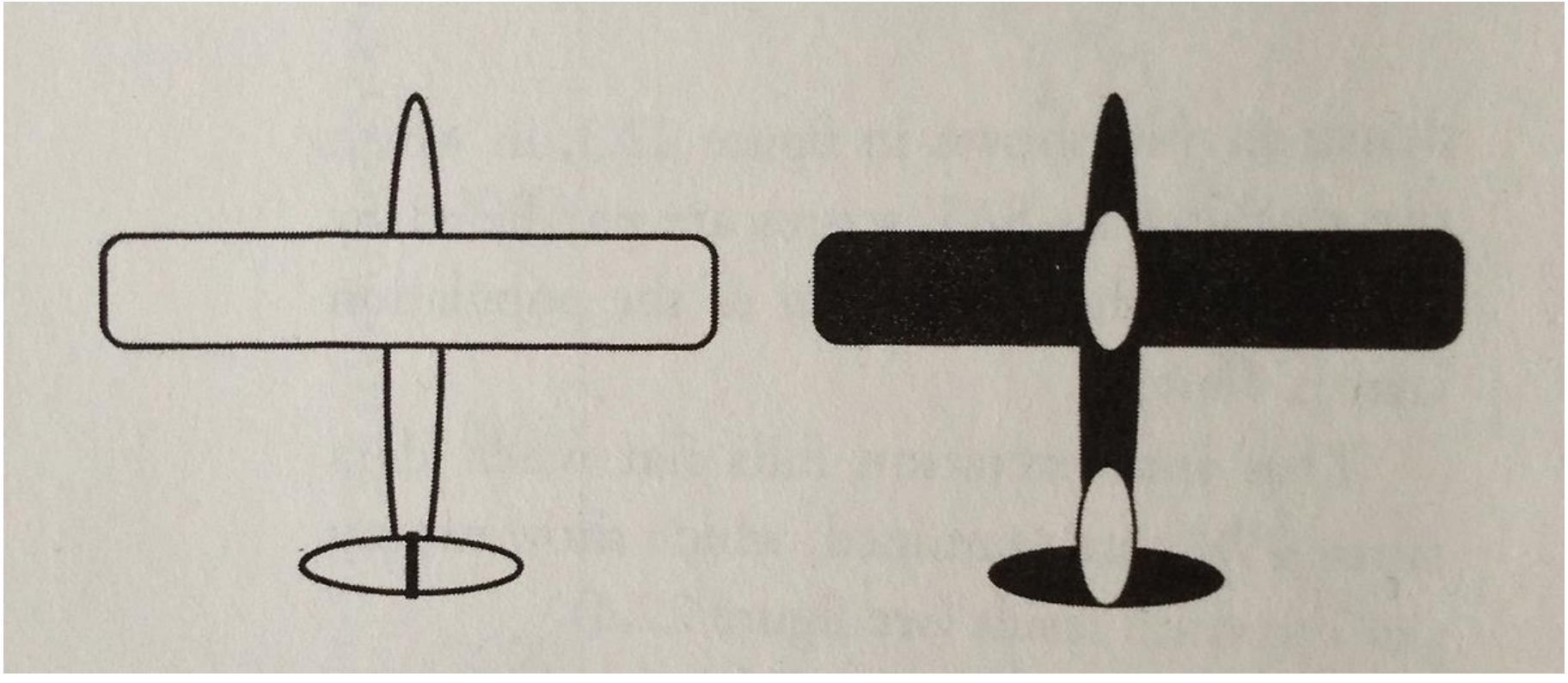
Google's flu

- From Google Flu

GoogleFlu

- ... To the wisdom of Abraham Wald...
- *He said the military didn't need to reinforce the spots that had bullet holes. They needed to reinforce the spots that didn't have bullet holes.*
- Open Hyperlink

Wald’s Planes



Program structure: 4 pillars

Economics	Management
Quantitative tools (mathematics and statistics)	Computer science and informatics

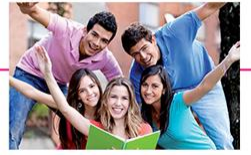
The study path

Economics, Management

computer science, finance, law

and quantitative methods

Soft skills	Foreign languages	Personalization of the study track (electives)	Seminars	Study abroad	Internship



Study plan- First year

1° year		CP
Semester I	Fundamentals of Computer Science	8
	Mathematics & Statistics - Module 1 (Mathematics)	8
	Principles of Management	8
		24
Semester II	Mathematics & Statistics - Module 2 (Statistics)	8
	Microeconomics	8
	Accounting	8
	Fundamentals of Information Technology Law	8
	First Foreign Language	4
		36

The first semester pairs computer science and statistics courses with management.

The second semester features a microeconomics class alongside accounting and IT law

Study plan- Second year

2nd year		
Semester I	Advanced Mathematics & Statistics	
	Module 1 (Applied Mathematics)	7
	Macroeconomics	8
	Fundamentals of Computer Programming	7
	Advanced Information Technology Law	7
		29
Semester II	Advanced Mathematics & Statistics	
	Module 2 (Advanced Statistical Methods)	7
	Machine Learning	6
	Econometrics	8
	Principles of Finance	7
	Seminars	1
	Second Foreign Language	4
		33

In the second year you will go through higher levels in mathematics and statistics while adding machine learning, econometrics, finance and a second foreign language.

Study plan- Third year

3rd year		
Semester I	Big Data and Databases	6
	Computational Microeconomics Module 1 (Game Theory)	6
	Marketing Analytics	6
	1 elective	6
		28
Semester II	Computational Microeconomics Module 2 (Mechanism Design)	6
	Information Systems Management	6
	1 elective	6
	1 elective or internship	6
	Seminars	1
	Final Report	3
		30

During the third year, you will be exposed to advanced subjects on big data and databases, advanced economics models of mechanism design and game theory, techniques for marketing analytics and the management of information systems.

Program features

Ad hoc seminars offered in collaboration with partner companies (Google, Cisco, IBM, SAS, Facebook, Oracle, HP, …)

Electives such as

- Social media and branding
- Big data and public policy,
- Theoretical computer science,
- Logics and algorithms
- Advanced computer programming

Program features & teaching methods

Small international class

International Faculty

Multimedia learning support

Interactive teaching

Group work

Comparative approach

After Completing the Bachelor

Graduating students can either continue with a Master program or enter the job market.

Graduates are prepared to cover junior professional positions at home and abroad:

- in company units (i.e. marketing, communication…) that support planning and strategizing
- in research departments of public and private institutions or consulting firms,
- in financial institutions for the analysis of financial data.