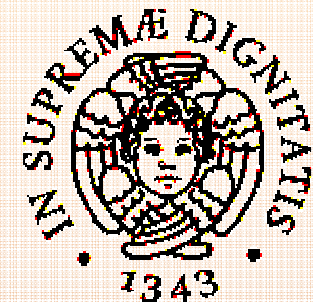# A Graduate Program in Business Informatics: Experiences at the University of Pisa

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European Computer Science Summit 2009

Motivations and history

- Decline of enrolments in traditional informatics programs experienced in late '90s tackled by promoting interdisciplinary programs
- Surveys indicated the need for graduates with skills both in Informatics and Business Economics in order to develop applications to **support decision making**
- Tight connections with the research topics carried out by the Departments of Informatics, Economics, and Business Economics in:
  - datawarehousing, data mining, marketing, business information systems

Motivations and history

In 2002, the graduate program
Informatica per l'Economia e per l'Azienda
was thus designed to prepare graduates both
- to master the information technologies, and
- to understand the needs of organizations
with a specific training in
Business Intelligence for decision support

The program was in the 23/S Informatics class and granted access to the Italian State Exam for IT Professional Engineer as well as to Ph.D. programs in Informatics.

Graduate program structure

- An inter-faculty program
  - Faculty of Science & Faculty of Economics
- Two curricula for a total of 180 credits
  - 1 credit = 8 h of teaching in frontal lessons (12 h for labs) + 17 h of individual study (13 h for labs)
- One curriculum for undergraduates in
  - Informatics
- One curriculum for undergraduates in:
  - Economics,
  - Business Economics,
  - Statistics for Business Economics

Curriculum for undergr. in Informatics

- Compulsory subjects (46 credits)
  - 10 credits in Microeconomics
  - 10 credits in Business economics
  - 5 credits in Statistics
  - 21 credits in Business Intelligence

    - Databases for decision support (5 credits)
    - Enterprise Information Systems (5 credits)
    - Data Mining (5 credits)
   - Laboratory of Business Intelligence (6 credits)

Curriculum for undergr. in Informatics

- Compulsory subjects (46 credits)
  - 10 credits in Microeconomics
  - 10 credits in Business economics
  - 5 credits in Statistics
  - 21 credits in Business Intelligence
- Elective subjects (56 credits)
  - 25 credits from one of
    - Economics, Business Economics, Business Law
  - 10 credits fron any of
    - Economics, Business Economics, Business Law
  - 5 credits in Management Information Systems
  - 10 credits in Informatics
  - 6 credits in any area
- Thesis (18 credits)

Notable accomplishments

- Quality Assurance Accreditation
  - wrt. CRUI guidelines, inspired by ISO 9001 norms
  - annual self-assessment & peer review (2003-2007)

- Awards
  - Regione Toscana (European Social Fund) grant for Expert in Business Intelligence module

- Satisfaction of students
  - Evaluation questionnaires at the end of each semester
    - At the end of each semester, for each course
    - Range 1 (very negative) to 4 (very positive)
    - Overall average: always greater than 3.
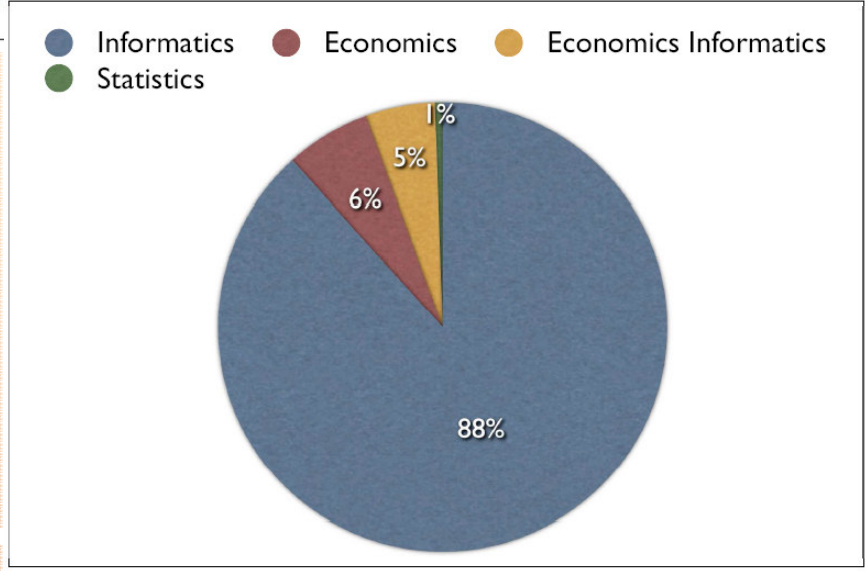
Notable accomplishments: enrolments
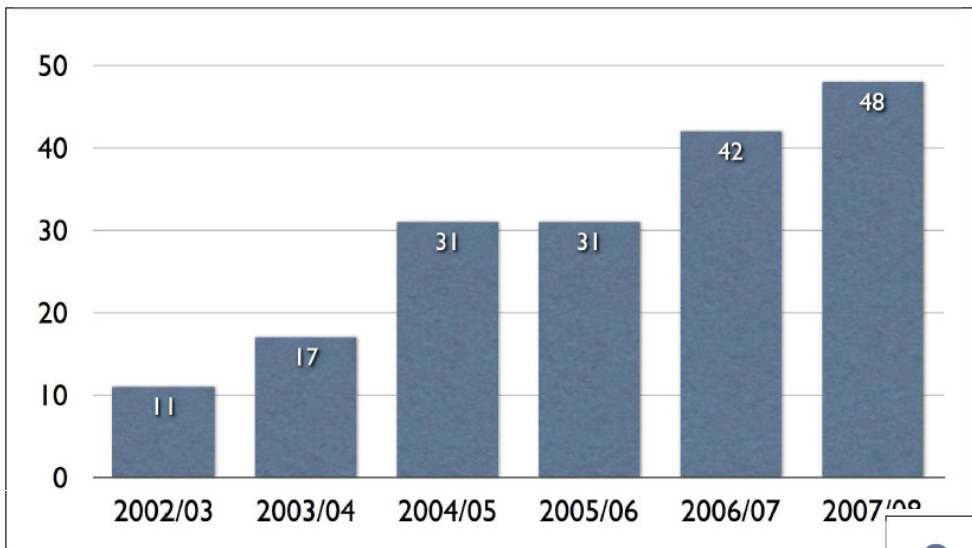
New enrolments: **180**

Withdrawls: **23** (**13%**)

56 enrolments (**31%**) from other **16** universities

21 enrolments (**12%**) of undergraduates not in Informatics

Notable accomplishments

- Internships for thesis preparation
  - Not compulsory, three to four months in public or private companies
  - Agreements with more than 30 companies, mostly in Milan and Rome, so not just in the Pisa area
  - Software houses, but also companies in the area of consulting, auditing, fashion, mobile telephony, manufacturing, retail, and supermarket chains.
- Satisfaction of graduates
  - Self-evaluation report 2006 conducted interviews
    - 65% total match between job and the training received
    - 22% partial match, 13% no match
  - Internship much appreciated (33 out of 47, i.e., 70%)
    - entry point for stable employment

Notable accomplishments

- Number of years to graduate
- Number of month to find a job

Graduates: **47**

Avg n. of months
to find a job: **1**
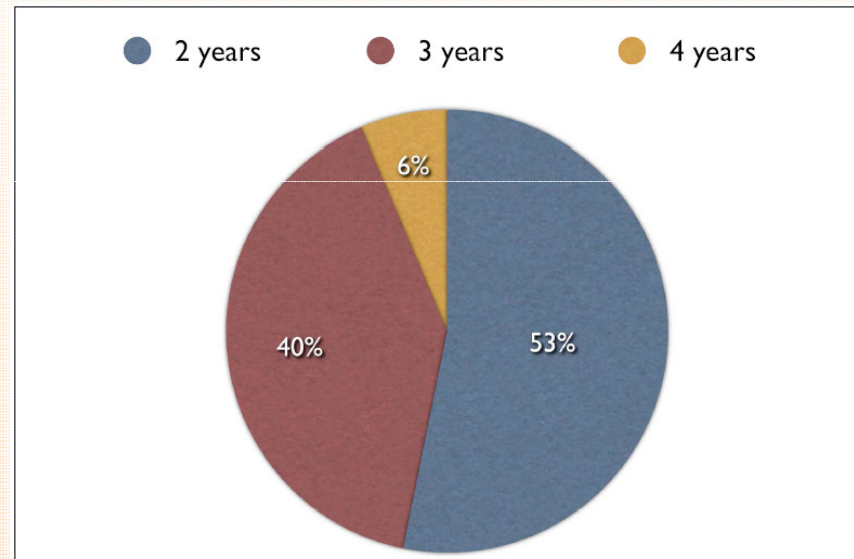
A new version of the graduate program

- New law in 2008 about University programs
- Design of an inter-class program
  - LM-18 Informatics &
  - LM-91 Techniques and Methods for the Information Society
- Two curricula, as before
- Enriched compulsory subjects in Business Intelligence (36 credits)

Decision support databases   *Data mining: advanced topics*

Data-driven decision methods   *Business Process Modeling*

Data mining: foundations   *Business Intelligence Lab*
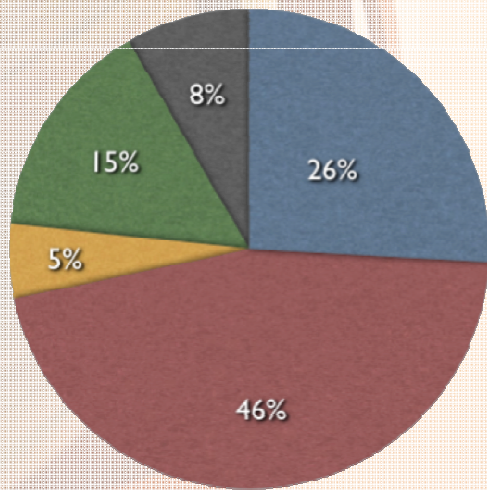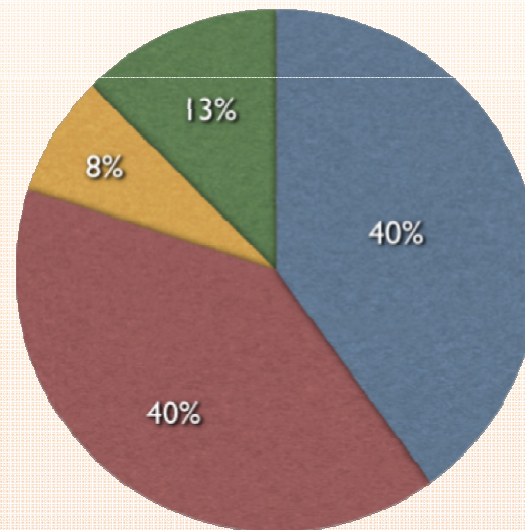
Conclusions

- An interdisciplinary graduate program to prepare professionals with both
  - the theoretical foundation and practical knowledge in informatics with a business perspective,
  - and specific skills in Business Intelligence techniques to develop decision support systems,
- attracts new students that make up for the decline of enrolment in Informatics,
- attracts highly motivated students looking for opportunity in a specific cultural area,
- graduates are highly sought after in the job market.

Conclusions

- Special attention to:
  - *Organizational issues*: appropriate (and resource-consuming) coordination of the management of the graduate program.
  - *The design of the syllabuses*: lack of funding, resources and time meant that ad hoc interdisciplinary courses could not always be prepared.
  - *The workload of supervising theses*: due to the high number of enrolled students compared to the number of researchers working in informatics and business topics. Internships have been very effective in mitigating this issue.