

Chapter 55

UB1 –HIT Dual Master's Programme: A Double Complementary International Collaboration Approach

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ABSTRACT

This chapter presents a double complementary international collaboration approach between the University of Bordeaux 1 (UB1) and Harbin Institute of Technology (HIT). Within this framework, the higher education collaboration (dual Master's degree programme) is supported by research collaboration that has existed for more than 15 years. Furthermore this collaboration is based on the complementarities of competencies of the two sides: production system engineering (UB1) and software system engineering (HIT). After a brief introduction on the background and overview, the complementarities between UB1 and HIT are assessed. Then a formal model of the curriculum of the dual UB1-HIT Master's programme is shown in detail. A unified case study on manufacturing resource planning (MRPII) learning is presented. Preliminary results of the Master's programme are discussed on the basis of an investigation carried out on the first two cohorts of students.

BACKGROUND AND OVERVIEW

Research relationships between the University of Bordeaux 1 (UB1, France) and Harbin Institute of Technology (HIT, China) exist for several years and both parties have established strong

and long-term relationships with their industries over some 30 years. In the research domain on computer integrated manufacturing and production system engineering and integration, the co-operation between the University of Bordeaux 1 (IMS-LAPS: Laboratory for the Integration of Materials into Systems-Automation and Produc-

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tion Science Department) and China started in 1993. Several Europe-China projects coordinated by UB1 have been carried out (1993-1995; 1996-1997; 1998-2002) in this domain, involving more than 7 major Chinese universities such as Tsinghua University, Xi'an Jiaotong University, Harbin Institute of Technology, Huazhong University of Sciences and Technologies, and others. More recently, the cooperation between the University of Bordeaux 1 and Harbin Institute of Technology has been strengthened to develop enterprise interoperability research activities in the Interop Network of Excellence (2004-2007) programme under the auspices of the European 6th Framework Programme for Research & Development (FP6) (European Commission, 2003b).

There is a long and strong cooperation between UB1 and HIT in research on other topics as well, including enterprise system modelling, engineering and integration. However co-operation in higher education was not so well-developed in the past. Consequently, it was logical to extend the existing co-operation from the research base to incorporate higher education.

Therefore, in September 2006 UB1 and HIT launched a dual master's degree programme on enterprise software and production systems. This programme relies on the know-how of HIT in computer sciences and enterprise software applications, and of UB1 in enterprise modelling, integration and interoperability research.

This joint international programme aims to train future *system architects* of production systems, with the ability to model, analyze, design and implement solutions covering organization, management, and computer science in order to improve performance of both manufacturing and service enterprises. It also aims to develop the capabilities of students to develop and grow in an international working environment particularly in China or France but also in most other countries where the themes covered by the programme are now and will continue to be vital.

The programme is organized over two years. The first year's courses are given in HIT and are concerned with industrial oriented computer sciences. The second year's courses are given in UB1 and dedicated to production management and engineering. The first two cohorts of the master's programme have successfully completed their studies and their industry internships in China and France and have obtained the Master's Degree of the University of Bordeaux 1 and the Master's Degree of Harbin Institute of Technology in September 2008 and 2009.

Table 1 gives an overview on the organization of the two year programme. All courses are presented in English, including examinations and internship defense. One characteristic is that the industry internship can be carried out in China, or in France or in any third country in the world.

Table 1. Organisation of the dual master's programme

Year 1		
Teaching/training	Semester	Location
Project	First	Harbin or Bordeaux
Internship	First	World
Courses	Second	Harbin
Detail: • Project (135h / 9 ECTS - European Credits Transfer System), • Training in enterprise (305h / 21 ECTS), • Algorithm and System Design and Analysis (90h / 6 ECTS), • Database Design and Application (analysis and design) (94h / 6 ECTS), • Software Architecture and Quality (93h/6 ECTS), • Project Management and Software development (92h / 6 ECTS), • Object-Oriented Technology and UML (86h / 6 ECTS).		
Year 2		
Teaching/training	Semester	Location
Courses	Third	Bordeaux
Training in company	Fourth	World
Detail: • Modelling of industrial systems (135h / 9 ECTS), • Production management (135h / 9 ECTS), • Industry performance measurement (45h / 3 ECTS), • Industry systems integration (90 h / 6 ECTS), • Option (45h / 3 ECTS), • Training in enterprise (450h / 30 ECTS).		

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