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D. M. Chamberlain
Information Systems Department, City University of Hong Kong

J. M. Verner
Information Systems Department, City University of Hong Kong

M.K.O. Lee
Information Systems Department, City University of Hong Kong

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D. M. Chamberlain, J. M. Verner, and M. K. O. Lee
Information Systems Department
City University of Hong Kong

Hong Kong has seen a major growth in its economy and tertiary education sector in the last decade. Its GDP per capita now exceeds most European countries and is the second highest in Asia, after only Japan. The number of Universities has grown from 2 to 6 in the same period. City University, one of the new Universities was established in 1984. Foreseeing the increasing demand for computing graduates in Hong Kong, the Computer Studies Department was established in 1983 at the University to train graduates to fulfill this demand. However by 1990 it was obvious that the Hong Kong economy was moving rapidly and structurally from an industrial/manufacturing one to a service-oriented one. The demand for computing graduates was shifting from a technology oriented one to a business oriented one. As a result the new academic department of Information Systems was formed and one of its first tasks was to develop an Information Systems degree programme to serve the increasing demand for business oriented computing graduates which the existing computer studies degree was not designed to do. The first students were enrolled in Sept. 1991 and we now have an annual intake of 125 students.

One aspect of quality assurance at City University is the requirement to carry out a comprehensive and deep review of each academic programme. The review is expected to cover nine major areas: the continued contribution of the programme to the mission of the university, maintenance of academic standards, maintenance of demand from potential and suitable students, appropriateness of course design and structure, appropriateness of teaching, learning and assessment strategies, relations with employers and professional bodies, course management and quality assurance, adequacy of resources for delivery, and need to change intake numbers. The review, and its resulting changes to the programme, are then subjected to rigorous peer review which includes both academic and relevant professional members external to the university. All academic programmes at City University undergo a major review every 5 or 6 years. This revalidation process is now providing us with an opportunity to redesign the programme.

We now describe our current degree and we follow this with a description of the revalidation process. We then outline our new degree structure and conclude with a discussion on the lessons learned from our redesign process.

Current situation

Our current undergraduate degree is a B.A. based loosely on the English model (Table 1). It is a three year course offered by the Information Systems Department within the Business Faculty of the University. Our first graduating class was in June 1994. The design of the original course was heavily influenced by research carried out in the 1979s and 1980s which showed that the knowledge and skills required by IS professionals is different from that required by programmers. We were concerned to provide a suitable educational background for analysts, designers, project leaders and IS managers who all spend substantial time interacting with people. We wished to make sure that our students had an understanding that people and their behaviour is as critical to the development of information systems as is the technology that underpins them. We did not want our degree to be merely business-oriented computer science but rather to underline the importance of human behavior to successful, effective and efficient information systems.

However, perhaps the most important design element was to develop a course which would prepare a new generation of business people, "the hybrid manager" (Earl, 1989). A "hybrid manager" is of two types, either a business person with a good understanding of information technologies or an information systems person with a good understanding of the business aspects of their organizations. We deliberately created a course which could develop both types of hybrid manager. Using a core of business, information systems methods and technology with a substantial range of elective topics in business and information systems

students can follow a core programme but also be able to tailor a programme of studies which can lead them into a variety of fairly specific career paths. Programming is taught through the use of 4GLs.

The current degree program consists of the following courses (numbers show taught hours)

Year 1
Fundamentals of Information Systems (84)
Rapid Systems Development (112)
Computing Environment (84)
Quantitative Methods for Business (84)
Principles of Business (42)
Communication for Computing I (42)
Year 2
Physical Systems Design (84)
Systems Analysis & Design (84)
Work Behaviour in Organisations & Society (84)
IS Management & Economics (56)
Communications for Computing II (42)
Accounting for Financial Decisions (42)
Managerial Accounting (42)
Electives (84)
Year 3
Project (112)
IS Strategy (84)
Information in Organisations (84)
IS Electives (84)
Free Electives (84)
Table 1 Current degree program

Review Process

As part of our review process, views were solicited from students, graduates, employers, external examiners and academic staff from the IS department. The process and the instruments used are documented in (Chamberlain 1996).

Students: There was a clear desire for an increase in the number of electives in all years. The content and treatment of some of the current compulsory modules needed to be reviewed particularly with the idea of making the serviced modules (i.e. modules taught by other departments) more relevant to IS needs.

Staff: The number of modules dealing with the implementation of IS was thought to be in need of some increase. In line with the student responses there was a general feeling amongst staff that more electives should be provided.

*Employers***:** One employer suggested that competition from IT and CS graduates the PRC may be a real threat and that business and organizational knowledge will be our graduates' advantage. Many employers stressed the importance of communication skills especially a proficiency in both Chinese and English. Several felt that the non-technical aspects of IS development were important. They also wanted a balanced view between desktop and large, complex computer systems. Some suggestions included teaching of object-oriented design and object-oriented databases, client/server development, project management and organizational and business strategies. The one weakness of the course was associated with the ability of graduates to obtain their first, entry level position in IS. There was a strong feeling that we should adopt a more conservative approach with the emphasis on software development being first taught through a third generation language such as Visual BASIC using a sound program design methodology. Overall employers still see the career path for IS graduates as being from programmer to analyst into project and then general

management. This, despite the evidence of the last thirty years or so, that the skills of the programmer are unrelated to the skills required for analysis and design or for junior and senior IS management roles.

Staffing

It is proving increasingly difficult to recruit staff to meet teaching needs in certain areas. Within the department, and for this course in particular, the soft aspects of information systems play a major role. Subjects such as IS Audit, IS Planning, IS Management, IS Services Management and Requirements Analysis and Engineering are areas in which it is notoriously difficult to recruit staff. The more technical areas of expertise have been easier to support with a large number of Ph.D. holders in Computer Science being available. In some areas the department is heavily reliant on professionally qualified staff to cover certain subjects and as these staff leave it is becoming more and more difficult to replace their expertise.

A New Degree Programme

We wish to build on the strengths already there. It is a well-recognized degree and it is meeting a growing demand from employers who have a need for graduates who have both technical and business skills. The increasing diversity of job requirements leads to an increase in the number of electives offered with a consequent reduction in core modules. In many respects the revised course (Table 2) remains much the same as its present form, except for the following: strengthen the programming competence, provide a wider range of electives, provide wider opportunity for project-type activity. Because of this it has been decided to adopt a flexible approach where the students are encouraged to make an informed choice as to their programme.

The new degree structure is shown below (numbers show taught hours)

Year 1
Organizational Information Systems (42)
Analysis & Design I (42)
Software Design & Construction (84)
IS Technology I (42)
IS Technology II (42)
Business Organization (42)
Organizational Behaviour (42)
Economics (42)
Business Statistics (42)
Accounting for Financial Decisions (42)
Elective (42)
Year 2
Analysis & Design II (42)
Analysis & Design Case Study (42)
Database Design & Implementation (42)
Business Appn. Software Development Case Study (42)
Distributed & Client Server IS (42)
English for IS I (42)
English for IS II (42)
Human Computer Interaction (42)
Electives (144)
Year 3
IS Planning & Project Management (42)
Ethical & Professional Issues in IS (42)
Electives (336)
Table 2 - New Degree Structure

Electives

We have not completely finalized the details of the electives we will be offering. In all we have over 30 elective module syllabuses prepared. Some of the electives we have defined include (in no particular order): Practical Implementation of IS Networks; Internet Applications and Use; Information Systems Strategy; Advanced Decision Support Systems; Data Structures and File Organization; IS Security, Control and Audit; Business Process Re-engineering; Expert Systems; Software Metrics; Decision Support Systems; Electronic Commerce; Planning and Procurement of IS Infrastructure; Introductory Programming in C; Enterprise-wide Networking; Applications Development on the World-Wide Web; Requirements Engineering; C++ for Object-Oriented Software; Team Programming Using 4GLs; Performance Management in Information Systems; Advanced Database Management Systems; History of Computing and Information Systems; Software Integration; Chinese Information Systems; and Multimedia and Hypermedia.

MISQ curriculum comparison

IS95 (Couger, 95) contains comprehensive guidelines for undergraduate IS curriculum. Although our redesign team was aware of these guidelines, there was a certain degree of reluctance in the beginning to adopt them because they may not be applicable in Hong Kong with its different environmental and cultural context. Therefore, it was decided that the team should go through the processes of getting feedback from all types of stakeholders before proceeding on to redesign the curriculum to ensure that the redesigned programme will satisfy the needs of the local stakeholders. In particular, student feedback was solicited extensively which was not the case with IS95 (Couger, 95, p.358).

However, the redesigned programme does turn out to be quite compatible with the recommended course structure for the IS95 IS Major. The major building blocks of IS foundation, business knowledge, IS theory, information technology, IS development, IS deployment and management processes are all covered in the first two years of the curriculum. In addition, students are given a wide choice in terms of specialization in their final year of study from an extensive elective list of specialized modules. This is something that only a large IS department like ours (with over 20 faculty) can support under normal circumstances.

Conclusions

The revalidation process has provided us with a good opportunity for a major course redesign. We find the involvement of all stakeholders in the redesign process to be most valuable in enabling the design of a programme suitable for local needs. Although starting from a local perspective, with much local input, the resulting curriculum converges to a significant extent with that suggested by IS95. Due to the extensive scope and the very fast changing nature of the IS discipline, the stakeholders (and, in particular, the review team) feel that flexibility and responsiveness are the key to a successful curriculum. Guided by the desire to design a flexible and responsive curriculum, the resulting curriculum contains a relatively small common core (which should be relatively stable in content) and a sizable elective programme (which allows for quick changes and offers great flexibility in terms of specialization). However, such a curriculum is resource intensive in terms of support. Small IS departments may find it difficult to support such a curriculum.

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