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ASSESSING THE IMPACT OF SYSTEMS ANALYSIS AND DESIGN ON THE PROJECT: PROPOSED CURRICULA CHANGES

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ABSTRACT

At UNITEC, Systems Analysis and Design is taught, in part, to meet the needs of the final year project. This paper briefly looks at the Systems Analysis and Design course and the Project course and then considers changes required in a fast moving curriculum area. It finds that many students use the methodology taught in Systems Analysis and Design to produce the documentation for their project. The paper then looks to new horizons and what may be coming in the future.

1. INTRODUCTION

For several years now UNITEC Institute of Technology, Auckland has been using the textbook "Systems Analysis and Design Methods" by Whitten, Bentley and Dittman. This book uses the classic Systems Development Lifecycle approach and introduces a specific methodology known as "FAST". As this is a compulsory course for students who undertake a project, it is hoped that students have a software development methodology to rely on when they do their project. A brief description is given of the two courses and of the "FAST" methodology. Interviews were held with the course coordinators for the two courses and the impact of teaching this methodology on the project is assessed. We will also look towards the horizon and see what is to come or what may be. Recommendations for changes are given.

2. THE DEGREE

The Bachelor of Computing Systems (BCS) is a well established degree at UNITEC and was originally approved in 1996. Students have to complete several courses, some of which are compulsory and others optional, totalling 360 credits in all. Most of the compulsory courses are at level 5. There are also two other compulsory courses at a higher level. A student must complete the level 6 course ISCG634 Systems Analysis and Design 1 and the level 7 course ISCG729 Project. ISCG631 Project Planning and Control is another prerequisite course for the project. A student will usually complete the level 5 compulsory courses in their first two semesters, attempt the Systems Analysis and Design course in the third semester, the Project Planning and Control course in the fourth semester and attempt the Project course in their sixth semester.

In order to gain the BCS, besides the compulsory courses the students need to complete other optional courses such as ISCG732 Systems Analysis and Design 2, ISCG727 Object Oriented Analysis and Design and several courses in Data Communications, Networks, Programming, Databases, Multimedia.

3. SYSTEMS ANALYSIS & DESIGN

The Systems Analysis and Design course introduces students to the System Development Life Cycle. As in most courses with this name, the student is taught a number of tools and techniques such as process modelling and data modelling and works

through tasks in the System Development Life Cycle (SDLC) with a series of practical case studies. At UNITEC, we have been using the textbook "Systems Analysis and Design Methods" by Whitten *et al.*. The fourth edition was published in 1998 and the fifth edition was published in 2000. One reason for choosing this textbook is that, besides the general information, it concentrates on one SDLC methodology providing procedures and templates for the student to follow. At some other institutes the teaching is only done generally so that the student knows the tools and techniques but has not followed a definite methodology.

Whitten *et al.* (2002) introduce the "FAST" methodology. This is nothing to do with the speed of the methodology but stands for Framework for the Application of Systems Techniques. As they say:

"FAST is not a real commercial methodology. We developed it as a composite of the best methodology practices we've encountered. Like many methodologies, it is flexible enough to provide for different types of projects and strategies." (Whitten et al. 2002, p78)

The systems development lifecycle is divided into seven phases:

- Preliminary Investigation
- Problem Analysis
- Requirements Analysis
- Decision Analysis
- Design
- Construction
- Implementation

Each phase has a series of tasks that need to be completed. Each task has a number of tools or techniques that can be used and various templates are provided.

4. PROJECT

Many institutes of technology and polytechnics have always had a compulsory project for the students to complete for their three year qualification. The student goes out to industry and completes a practical piece of work that is fully documented. UNITEC is not unique. The student must provide a project proposal and the completed project documentation in order to complete this project. In the completed documentation, it is recommended that there is a section entitled "Methodology" where the student explains what methodology they are using for the project.

5. CASE STUDY

Interviews were held with the course coordinator for the Systems Analysis and Design 1 (SAD1) and the course coordinator for the Project in the years 2001 and 2002.

During that time most of the projects were software development projects where the students had to prototype a system for a small organisation. A smaller number were networking projects, some feasibility studies for larger systems, others provided documentation for already existing systems.

The software development projects included the traditional SDLC projects for such activities as business transactions, rostering and timetabling, HR systems and others involved website development, multimedia and programming hand held devices.

Next the methodology used was examined. The students had all been taught the "FAST" methodology. Many applied this in their project. Some projects suited this methodology and some did not. The students who had done SAD1 only knew the methodology but did not know when to apply it. Even a network project was attempted using the "FAST" methodology. Students who had done more advanced courses such as Systems Analysis and Design 2 or Object Oriented Analysis and Design (both level 7) were able to make better choices regarding which methodology needed to be applied. For example there were some good web design projects done using Object Oriented Analysis and Design.

Doubt was raised concerning the choice of the methodology for the SAD1 course as the students need a more appropriate methodology for small system development projects that was flexible enough to handle different circumstances in this rapidly changing business environment.

6. CONCLUSIONS

The reason for introducing "FAST" in Systems Analysis and Design 1 certainly bears fruit in the project. We can therefore say that it is successful since many students are using the methodology that they have been taught. However the more successful projects were those where the students could evaluate the methodology and deliberately choose "FAST" if it was appropriate to their project, or reject "FAST" and use a different methodology.

NEW HORIZONS

It can be seen that there is a drawback when teaching only one methodology. The students learn

that methodology and apply it in both appropriate and inappropriate circumstances. With an ever changing computer environment the student needs to be exposed to other methodologies besides “FAST”. Students can study other courses and learn more about RAD or OOAD but this broadness needs to be introduced into the SAD1 course as the other courses are not compulsory. Many object oriented concepts need to be grasped by students at this level. We need to be able to teach the general principles of the System Development Lifecycle as well as become familiar with at least one methodology in particular.

We want the students to make a conscious decision as to what methodology best suits the project. So given that they are aware of different methodologies, the section on “Methodology” needs to be widened from an explanation of the methodology chosen to give reasons why this methodology was chosen and others rejected.

7. RECOMMENDATIONS

The recommendations concern two courses.

For ISCG634 Systems Analysis and Design 1, it is recommended that the teaching of one methodology be retained and that the students’ awareness of other methodologies is increased so that the students can make a choice between methodologies. The choice of that one methodology being “FAST” needs further discussion.

For ISCG729 Project, it is recommended that the section on “Methodology” be enlarged and gives an explanation of the methodology chosen and reasons for the choice.

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