Industry Based Capstone Projects Review Process and Assessments

SAVITRI BEVINAKOPPA
School of Information Technology and Engineering
Melbourne Institute of Technology
288 La Trobe St, Melbourne, VICTORIA
AUSTRALIA
sbevinakoppa@mit.edu.au http://www.mit.edu.au

Abstract: - Melbourne Institute of Technology (MIT) is leading private provider that is offering course in Information Technology, Engineering and Business area. MIT offers capstone projects as part of the Bachelor and Masters' courses. One of the Australian Computer Society (ACS) strong recommendation is to integrate industry based projects as part of the capstone projects. This paper explains the steps taken to ensure smooth running of industry based projects and to the required academic standard level. It is a complex process where industry based capstone project units involves number of variants: such as industry client, professional, internal project supervisors, common class, students' groups, supervision class etc. So far process is a manual approach in recording data, but future plan is to automate the process with interactive online educational project management system.

Key-Words: Industry-based projects, project management, capstone project, assessments, Bachelor degree, Master degree

1 Introduction

The School of Information Technology and Engineering coordinates process for reviewing, preparing, moderating, offering, and assessing of capstone projects. The capstone project is completed over two trimesters (BN301 and BN304 in Bachelor of Networking, and MN691 and MN692 in Master of Networking) [1]; students are expected to work on the same project over the two trimesters, except in exceptional circumstances such as a client withdrawing a project during the semester break in-between, or a student failing the first project unit while the rest of the group continues.

2. Background

Australian Computer Society (ACS) highly recommends to include industry based projects in ICT courses [2] to enable students to be ready with work-ready graduates. Capstone projects in final year of Bachelor and Master courses are very important where students can be trained to be work-ready graduates. Capstone projects where students will be applying their skills and knowledge that they study in their courses and able to learn required skills to be work-ready graduates [3, 4]. The number of capstone projects offered to students has been increasing every trimester dramatically for Networking Courses. Similarly there is strong emphasis on Industry-Based Projects offered to students. Steps have been taken to ensure that the School move into industry-based projects in a substantial way for the capstone units. Further, in order to ensure quality, the School has set up a Project Review Panel consisting of course coordinators of the IT and Engineering courses, and academic staff representatives; the panel assesses project proposals, gives feedback for improvement and finally approves those that satisfy the expected standards. In order to assist students in finding industry projects, MIT appointed a full-time Industry Liaison Officer as well as signed agreements with external organisations that have expertise in sourcing industry projects and internships. Students may find projects on their own, could be offered industry projects through their academic supervisor's industry contacts or, with the payment of a fee, through the organisations. A project proposal, irrespective of how it originates, needs to be approved by the School's project review panel before the commencement of the project.

MIT has partnered with three organisations who are charged with the responsibility of sourcing industry-based projects. These organisations find and present to School of IT and Engineering (SITE) projects from industry. Each company offering a project prepares a project proposal which includes project specifications and requirements to be met in the project.

Students have a choice of selecting industry clients: through above industry placement agents, through project supervisors and themselves. Course co-ordinator collects all industry proposals and presents them to project review panel committee. MIT provides project proposal template.

3. Review of Projects and Review Committee

Project proposals are reviewed by the SITE Project Review Panel Committee before they are offered to students as from week one of each trimester. The Project Review Committee includes course coordinators, academic project coordinators, capstone project unit lecturers and industry liaison officers.

In-order to provide required professional development, school organises two workshops: PD to students and PD to project supervisors.

1. **Workshop on Project Supervision**: All staff who will be supervising projects must attend this workshop. Course Coordinator facilitates this workshop at-least 2 weeks before start of each trimester. Project supervision is allocated only to registered MIT Project Supervisors.
2. **Regular workshop to students**: Training of students on expectations, how to interact with industry project supervisors and requirements to be met on projects are undertaken every fortnightly of the regular trimester. These workshops are facilitated by Academic Project Coordinator and Industry Liaison Officer.

3.1 Roles and responsibilities

Industry Liaison Officer (ILO) in consultation with Academic Project Coordinator organises week 12 presentation for all project units. Students' projects are assessed by internal panel of experts and judges for innovation, best presentation and best projects using a set of criteria derived by the School. Prizes sponsored by the MIT are also given in each campus to the best project in each student cohort. Detailed roles and responsibilities of Course coordinator, ILO, Academic Project coordinator, Unit lecturer are as follows:

Course Coordinator

- Coordinate the process
- Chairs the review panel meetings
- Regular meeting with APC
- Approval of project supervisors
- Coordination of internships

Industry Liaison Officer - ILO

- Coordination with external sources
  - Proposals collection, projects list (approved/to be updates/reject)
  - Students behaviour issues with clients
  - Clients behaviour issues
- Week 12 presentations (organising presentations for all SITE project units, trophies, certificates etc)

Academic Project Coordinator - APC

- Project Workshops to students
  - 6 times a trimester
- Project supervision professional development sessions
  - One full day (appr. 6 hours) – tentatively week 15
  - As needed before commencement of trimester
- Allocation of supervisors – in consultation with Unit Lecturers (UL)
- Project proposals - coordination
  - With ILO - Proposals from all sources – agents, students, supervisors
  - Students consultation (all project units)
  - Supervisors consultation – regular meeting with ULs

Unit Lecturer (UL)

- Students grouping
- Allocation of approved projects to students – in consultation with APC
- Students consultations
- Regular meeting with APC

Students are asked to provide the form with details of industry company profile, contact name with brief profile in week 2. Unit lecturers check these details and verifies them on company/advisor credentialability.

Industry client meetings

Students meet once a week for 12 weeks. Supervisors should meet industry client along with students for at-least 3 times in a trimester.

Pre-Assessment Moderation

Each assessment is moderated by the unit moderator to ensure it meets the required AQF level for the unit and also addresses the learning outcomes for the unit. They also check that there is a marking rubric for the assessment. Full-time staff members are usually the moderators.

Post-Assessment Moderation (internal)

At the end of the trimester the School also selects assessments from units for moderation by staff members who were not involved in any way in the delivery of the unit. Assessment from both campuses are moderated as a cross-campus moderation process, which means lecturers in Melbourne and Sydney moderate assessments given to them for both campuses. About a third of units offered in previous trimester are moderated using a random selection of reports from the best to the least scored report. Normally 5 samples are used for this process. Post assessment moderation is done to ensure that the reports have been fairly assessed with feedback given to students by lecturers and that the marking guidelines have been followed and used appropriately as well.

Post-Assessment Moderation (external)

Subject experts external to the institution who are teaching in Australian Universities are appointed by the Institute as external moderators of selected assessments. Post-assessment moderation are used as external validation of internal assessment processes and as sounding boards on what need to be improved internally. This is done periodically and planned so that each unit is externally moderated at least once a year. Normally experts in selected units are provided with unit descriptions, assessment material, marking guidelines and 5 samples which includes the best report to the least scored report are used for this process. Post assessment moderation is done to ensure that the unit has been taught as it should be, that assessments meet their AQF levels, have addressed the learning outcomes and that assessment processes have been followed.

In all the moderation exercises, moderation checklists are provided to the assessors for use. The checklists provide guide to the assessors on what to look for in addition to their expert opinions on the assessments.

4. Assignment Description

This paper provides an extensive coverage of assessing students skills and knowledge. Assessment in capstone project is challenging [5, 6].

MN691 Research Methods and Project Design Marking guideline

Assignment submission and Marks:

- Assignments 1, 2 and 3 are to be submitted as group work.
- Submission of self-evaluation (i.e. reflective journal) and peer-evaluation is individual responsibility.
- The marks given for Assignments 1, 2 and 3 are calculated as the overall group marks multiplied by individual student's marks.

- The individual student's marks will be based on the individual's attendance and participation, as well as self and peer-evaluation, as per the following table:

In Week 5 (for weeks 1- 4)	Attendance and Participation / 8 Marks	Self and peer-evaluation Report / 4 Marks
In week 9 (for weeks 5- 8)	Attendance and Participation / 8 Marks	Self and peer-evaluation Report / 4 Marks
In week 11 (for weeks 9-11)	Attendance and Participation / 6 Marks	Self and peer-evaluation Report / 3 Marks

All Assessments will be marked by both, the project supervisors and the unit lecturer.

Assessment Task	**Due Date**	**Weightage**
Standard Students Code of Conduct form	Week 1	0
Client details with project proposal	Week 2	0
Assignment 1 Group report: Project Requirements Analysis and Specification* and Individual Report	Week 5	20
Assignment 2 Group report: Project plan and preliminary design* and Individual Report	Week 9	30
Assignment 3 Group report: A report on research undertaken for project planning, and research methods to be used for the next stage of the project* and Individual Report	Week 11	40
Assignment 4 Group presentations	Week 8 & 12	10
TOTALS		100

*Within a group task, a number of subtasks will be assigned to individuals in consultation with the project supervisor. This, along with the peer-evaluation of individual contributions to the project will be used to assess individual outcomes.

Individual marks will be calculated for each assignment as follows:

For example:

Group X marks for Assignment-1 group report = 16/20

Individual marks based on attendance and participation, as well as self and peer-evaluation:

Member 1 = 10/12
Member 2 = 12/12
Member 3 = 07/12
Member 4 = 00/12

Total marks for each member for Assignment-1:

Member 1 = 10/12 X 16 = 13.3 / 20
Member 2 = 12/12 X 16 = 16.0 / 20
Member 3 = 07/12 X 16 = 09.3 / 20
Member 4 = 00/12 X 16 = 00.0/ 20

Individual Report

Self (Reflective journal) and Peer-evaluation report

Due week 5, 9 and 11

1. Common Class and supervisor meeting attendance and participation = 2 Marks for each week.
2. Write summary of weekly activities in 2-3 paragraphs in each section (D, E, E, P) in one reflective journal table. (2 Marks for assignment 1 and 2, 1.5 Marks for assignment 4)

	Description
Describe: How effectively did you work and contribute to your group?	
Explore: List at-least 2 of your contributions to the project. Were your behaviours valuable or detrimental to the team?	
Evaluate: How do you justify your at-least 2 valuables/contributions to the team and at-least one detrimental to the team?	
Plan:	

What did you learn about working in a group from this project that you will carry into your next group experience?	

3. Peer evaluation: Write peer evaluation report. (2 Marks for assignment 1 and 2, 1.5 Marks for assignment 4)

Write the name of each of your group members in a separate column. For each person, indicate the extent to which you agree with the statement on the left, using a scale of 1-4 (1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree). Total the numbers in each column.

Evaluation Criteria	**Group member**	**Justify**
Attends group meetings regularly and arrives on time.		
Contributes meaningfully to group discussions.		
Completes group assignments on time.		
Prepares work in a quality manner.		
Demonstrates a cooperative and supportive attitude.		
Contributes significantly to the success of the project.		
TOTALS		

Individual Report 2 for assignment 2 should include reflective journal on industry professional workshops. Students who could not attend week 6 and 7 industry professional workshops, should include report on 4 hours equivalent of the professional exposure.

Examples of professional exposure

- Practical exposure in an environment outside the teaching establishment
- Guest lectures
- Use of industry visits and inspection
- Interviewing IT professionals
- Being mentored by a professional
- Direct industry input of data and advice to problem solving, projects and evaluation tasks

Examples	***Evidence of activity***
Practical exposure in an environment outside the teaching establishment such as Industry placements (paid or unpaid)	Work exposure letter from employer, students' reflective journal
Guest lecturers	Record of guest lecturer, seminar leader presentation, students' reflective journal and e-portfolio
Use of industry visits and inspection	Letter from employer, students' reflective journal
Industry contacts/visit for feasibility studies Examples: contact supplier, industry professional to gather data or requirement.	Letter from employer, students' reflective journal
Seminars presented by industry professionals	Evidence: flyers distributed to students advertising seminars; letters to quest speakers; reflective journal and e-portfolio
Being mentored by a professional	Student records of mentor meetings in e-log
Direct industry input of data and advice to problem solving, projects and evaluation tasks	Industry-based projects. Where possible industry mentors will have some time available to advise students and/or to have input into student assessment. This may mean e.g. An expert present for student presentations. Evidence: letter from expert agreeing to mentor project Record of contact in student diary/e-log
Attend professional association seminar / event	Record each contact in a student diary or e-log, certificate of attendance, email confirmation etc.

MN692 Capstone Project

Unit learning outcomes

At the completion of this unit, students will be able to:

a. Demonstrate the ability to conceptualise, research, design, plan and execute a substantial capstone project
b. Adapt and apply the knowledge and skills acquired over the core units of the course in planning and executing a capstone project in an area related to Networking
c. Orally present the research background, design, implementation, results and conclusions to an audience of peers and academic staff
d. Through written reflective journals and project reports, demonstrate communication and technical research skills to justify and interpret problems, methodologies, conclusions and professional decisions
e. Demonstrate the application of knowledge and skills with a high level of personal autonomy and accountability while being part of a team-based working environment.

Assessment Task	**Due Date**	**Weight**	**Learning Outcomes Assessed**
Assignment 1 Group report: Project	Week 3	10%	a,b,e
Assignment 2 Group report: Project Implementation and evaluation report* and Individual Report Demonstration to supervisor is every week.	Week 11	50%	a, b, e
Assignment 3 Individual report: Peer evaluation of contributions of team members and reflective journal on professional practice/experience	Week 12	30%	d,e
Assignment 4 Group presentation*	Week 12	10%	c
TOTAL	100%		

Assignment 3 – Reflective journal on professional exposure - Individual report

2	Technical Skills Developed During Exposure • Summary of overall professional exposure • Mapping of units onto professional exposure • New technical skills or knowledge • Exposure in future
3	Professional Skills Developed During Professional Exposure • Practical exposure • Graduate Outcomes Table • Your approach to change • Recommendation to become a successful network professional • Future plans as a network professional
4	References
5	Professional Exposure Certificate / evidence of attendance / participation
	Total Marks

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