UNIVERSITY OF TECHNOLOGY, SYDNEY

41025 Introduction to Software Development

Project - Analysis, Planning, Architecture, & Design

Assignment 1

Due Date: Softcopy Due by Friday 24/04/2020 11:55 PM AEST
Showcases in Week Commencing from 27/04/2020 -
During Related Workshop: See workshop schedule on UTS Online for exact dates/ time slots)

Submission: Each group will submit the following two items:

Report: Each group will submit a softcopy (Microsoft Word File or PDF) of the group assignment containing ISD project requirements, plan, architecture and design including individual contribution logbooks via Turnitin **before 24/04/2020 11:55 PM AEST**. Use the Project - Assessment item 1 Turnitin link (View/ Complete) on UTSOnline for submitting your assignment.

Prototype: Working software application prototype code will not be submitted via Turnitin. Submit ISD project working software prototype code files (source and executable) with readme file (how to deploy and run the software) as a single Zip file in the UTSOnline Assignment 1/ “Working Software Prototype Code Submission” folder using your relevant workshop link **before 24/04/2020 11:55 PM AEST**. **You can submit the software only once. You must not make any changes once the software code is submitted. If you make any changes after the submission due date then the late assignment rules will be applied.**

Your both project report and software prototype code submission files title/name must follow the following naming pattern.

Your workshop activity number–group id

For instance, if your Wrk1 activity number is 02 (see timetable for your activity) and group id is G1 then your submission file title/ name must be worded as 02-G1. From each group only one student (project leader) should submit the assignment on the behalf of the whole group. You do not need to put the student ids of all the group members on the file title/ name. You must check Turnitin report and ensure that your work does not contain plagiarism. You may submit your report to Turnitin many times before the submission due date. Final Turnitin reports can be used as evidence by the teaching staff in the event that plagiarism is suspected in an assignment and will be dealt as per University rules. **Do not allow anyone to copy your solution – this is considered misconduct; all miscreants will receive a mark of 0, at best for the assignment and will be dealt as per University rules**. You may be required to provide the hard or soft copy of the assignment anytime during the semester.

Marks: 30%

Word Limits: This is a technical report, thus there is no compulsory minimum and maximum word limit. For a general guidance, the recommended word limit for this assignment is maximum 5000 words excluding diagrams, bibliography, logbooks and appendices. Word limit will be regarded as recommended rather than compulsory, and no student will be disadvantaged by being under or over the recommended word limit.

Method: The assignment will be done in a group (preferably in the same workshop). Group size should be limited to 4 and no more than 6 students (enrolment numbers and situation-specific circumstance will dictate the actual size of the groups). Groups will be formed in Weeks 2 and 3 with the help of your workshop teaching staff. It is not the responsibility of teaching staff to find a group for you; however, they would help you to put in a group. Once the groups are formed and for any reason(s) you want to change the group, then it is solely your responsibility to make other arrangements and find another alternative group who is willing to accept you. This is a group assignment and you must respect other students in the same group, different groups and teaching staff. **If you have any group issues, then you must inform your workshop tutor as soon as possible and well before (at least 1 week or earlier) the assignment submission or due date. Group assignment issues reported on or after the assignment submission date may not be considered.** **There will be zero tolerance for any academic and non-academic misconduct**. **See University Rules, Subject Outline and Academic Misconduct section of this brief for details**.

Objectives: Subject objectives: 1, 2, 3, 4 and 5

1. Investigate and solve software development problems with minimal supervision.
2. Determine and balance the competing goals of software development activities within their constraints
3. Plan and manage a software development task to create, modify or extend a software feature or function to completion within the task constraints.
4. Apply sound software engineering practices to successfully create, modify or extend a software feature or function.
5. Communicate clearly software and task information to interested stakeholders

Type: Project

Groupwork: Group, group and individually assessed

Criteria: The assignment will be assessed based on the following criteria.

Criteria Items	Key Objectives	Weight
Problem requirements, constraints, risks (6 Marks)	1,2,5	20%
Solution estimation, planning (6 Marks)	2,3,5	20%
Solution architecture (6 Marks)	1,2,5	20%

Solution design (6 Marks)	1,2,5	20%
Coded solution prototype: architecture spike (6 Marks)	4,5	20%
Total	-	100%

The on-line tool SPARK shall be used to assess an individual's contribution to the group work. This means the group mark for the Assignment 1 shall be scaled by the individual's SPARK rating as described in the Subject Outline. The rating period for SPARK assessments, Assignment 1, will open on **24/04/2020 11:55 PM AEST and close on 27/04/2020 11:55 PM** AEST. Please be advised that if you fail to provide a rating via SPARK during the declared rating period, you will receive anywhere between 00.0 and 0.5 (50%) of the assessed group mark for the Assignment 1. Individuals who "abuse" the SPARK assessment methodology will also receive anywhere between 0.0 and 0.5 (50%) of the of the assessed group mark for the Assignment 1. Please read carefully the Assessment section of the Subject Outline. **Please also note that there will be no negotiation on a wrong answer**. An individual's mark for this group work assessment shall be computed as:

Individual Student Mark = Group Mark for Assessment Item 1 * Individual Spark plus rating

Task: This assessment task will require a team of 4-6 students to analyse the ISD Project: IoTBay case study; and produce, submit and present a group report containing software requirements & development plan, and architecture & design; and working software prototype. The deliverables of this assessment task also include an oral/visual group report and prototype presentation/ showcase (no PowerPoint slides) and individual contribution logbooks. **Any individual student who failed to appear and present in these compulsory assignment assessment and review sessions (Showcase) will receive zero (0) as a final individual mark.** Students may choose to work in a lab or from home. Each ISD project team needs to nominate a project manager/ lead who will submit the assignment 1 on the behalf of the whole group or team.

Assignment 1: Consolidated Report Structure for Deliverables

SECTION/ ITEMS	Maximum Marks	Note
Cover Sheet, Header Page and Approved Project Scope	-	• Sign, scan and embed FEIT declaration of originality cover sheet containing correct group name, student #, names and signatures in the report just before the project title/header page. • Analyse the IoTBay project brief and identify at least 4-6 processes, services or features for your project. • Document project scope items (process,

SECTION/ ITEMS	Maximum Marks	Note
		service or feature, role) in the project backlog table. **Note:** At least 1 service/feature per team member. Each service or feature can be broken down into several user stories. **If you do not include these then assignment will not be marked, and you may receive zero for the whole assignment.**
1. Requirements	**6**	**Requirements Backlog**
Functional Requirements	(4)	• Analyse the IoTBay project case study, and break down the (processes, services or features) into user stories (linked to project scope items) for the **whole project** and capture them in the requirements traceability matrix or backlog spreadsheet. You can also use Trello, Airtable, MS Excel and similar tool to capture the backlog. *See the requirements backlog template.* • Write narratives/details using the use case template. **Each student in a group will write a narrative for only 1 user story of their selected feature.** *See the use case template example.*
Data Requirements	(1)	• Document data requirements using the data dictionary template. **Groups must complete/ consolidate the data dictionary for the whole project based on the input from individual team members.** *See the data dictionary template.*
Non-functional Requirements	(0.5)	• Identify and capture at least 2 performance and 2 security requirements for the overall to-be developed software application as user stories in the requirements backlog matrix. *See the NFR example.*
Constraints & risks	(0.5)	• Identify and capture at least 2 constraints and 2 risks for the overall to-be developed software application.
2. Plan	**6**	**Project Schedule, cost estimates & timesheet**
Project schedule	(4)	• Decompose the whole project schedule into 2 releases (R1 and R2). Exclude R0 as you are already doing R0 for

SECTION/ ITEMS	Maximum Marks	Note
		assignment 1. Assignment 2 will be relevant to R1. • Decompose each release (R1 and R2) into 3 key iterations (I1, I2, I3) and also include additional iteration zero (I0) in each release. Thus, 4 iterations in total. *See the project schedule example.* • Calculate the whole project, release(s) (R1, R2) and iteration(s) (I0, I1, I2, I3) start and end dates. Ignore R0 as mentioned earlier. *See the project example.* • Estimate (use Fibonacci Numbers) and prioritise (H, M, L) user stories identified for the whole project. *See the backlog example.* • Develop the user story map. *See the user story example.* • Select the user stories in consultation with your tutor as minimum viable product for R1 of the IoTBay software application. • Select the user stories in consultation with your tutor (For R1 iterations. • Develop R1 iteration 1 (I1) card wall. You are not required to provide card wall for R2. *See the card wall example.* • Develop R1 iteration 1 (I1) schedule. You are not required to provide detailed schedule for R2.
Project cost estimates	(1)	• Calculate the cost estimates for the whole project (R1 and R2). Ignore R0 cost. • Calculate the cost estimates for R1. **Note:** Assuming each student in the ISD project team is working 8-10 hours per week for this project. Rate is fixed at $80 P/H. This is only human effort cost and you are

SECTION/ ITEMS	Maximum Marks	Note
		not required to calculate other hardware/ software costs (e.g. compute, network, storage, connectivity)
Project timesheet	(1)	• Each student to complete and submit the timesheet (current) signed by their project lead. **Note:** Assuming each student in the ISD project team is working 8-10 hours per week for this project. Rate is fixed at $80 P/H.
3. Solution Architecture	**6**	**Architecture based on MVC**
Data Architecture Model	(3)	Based on the data (dictionary) requirements: • Group needs to provide the overall **(consolidated)** conceptual data model diagram (without attributes) for the overall IoTBay software application (R0, R1 and R2). Concepts & relationships. *See the Conceptual Data Model example.*
Application Architecture Model	(3)	Model and describe overall IoTBay Application Architecture as follows: • Provide a group (consolidated) MVC architecture that describes the overall IoTBay software application (R0, R1 and R2). *See the group (consolidated) MVC Architecture Model example.* **Note:** The model diagram(s) should show architecture components and their relations following the MVC or relevant architecture pattern (s). You may use any drawing or modelling tool for architecture diagram.
4. Solution Design	**6**	**Solution Design based on MVC**
Interaction Design Model (UXD)	(2)	• Provide a single consolidated user or customer journey map for the overall IoTBay software application (R0, R1 and R2). *See the UXD example.*
Object Design Model (Class Diagram)	(2)	• Provide a single (consolidated) object class design model (business logic, interface classes, attributes and methods) for the overall IoTBay software application (R0, R1 and R2). *See the class diagram example.*
Backend Database Design Model (ERD)	(2)	Based on the data (dictionary) requirements and the conceptual data model: • Provide a single (consolidated) back-end

SECTION/ ITEMS	Maximum Marks	Note
		database design model diagram (ERD) with all the tables, normalised relationships (if relevant) and attributes for the overall IoTBay software application. *See the ERD example.*
5. Architecture Spike (Software Prototype)	**6**	Develop the software prototype (R0 release) by partially implementing the IoTBay architecture components/ layers. Each member in a group must individually develop and implement the following: **Interface –** Implement the index or landing page (home page) of the IoTBay application. It is the starting point of the web application and should provide the options of login and register to users. **Login page** – Implement the login page screen using web form (e.g. JSP). The login page must post the form-data to the welcome page. **Register page** – Implement the register page screen using web form (e.g. JSP). The register page must post the form-data to the welcome page. **Welcome page** – Implement the welcome page to retrieve the posted form-data from register and login. The welcome page must use JavaBeans and session to transport the user (registered or logged-in user) data to the main page. **Main page** – Implement the main page to retrieve the user Beans saved into session and display it. The main page must provide a logout link. **Logout page** – Implement the logout page for users to use from the main page. The logout page must redirect users to the index page and terminate the session. **Database** – Create an initial version of the IoTBay software application data model (JavaBeans).

SECTION/ ITEMS	Maximum Marks	Note
Presentation/ Showcase	-	You are not required to prepare and submit the presentation slides. Launch and present the report submitted via Turnitin. Present software prototype from your laptop during the compulsory showcase. **If a student does not present during the showcase, then he/she will receive zero for their project mark.**
Appendices – Individual Contribution Logbooks	-	Include contents from the Individual Contribution Logbooks. Link your individual contribution to weeks and hours recorded in timesheet and workshop/ lab activities. The individual contribution logbook is mandatory for students to submit with each Assignment: Assessment Items (1-2) to receive individual project marks. **If a student does not submit this logbook, then he/she will receive zero for their project mark.**
Total Maximum Marks	**30**	

You should use the Assignment 1 Report Structure (as explained above) as a guide for documenting deliverables, additional documents and information released with this assignment brief on UTSOnline in the Assignment 1 folder.

<u>You should regularly get feedback on the assignment tasks and deliverables from the coaches during the workshop sessions. Each student group should assume the role of a Software Provider Start-up Company for the ISD Project</u>.

Assessment Feedback

Feedback on the marked assignments will be within 2 weeks after the assignment due or submission date.

Minimum Requirements

See subject outline for details. **NO conceded passes are to be granted due to University Policy.**

Referencing Standards

All material derived from other works must be acknowledged and referenced accordingly using the Harvard Referencing Style (see http://www.bell.uts.edu.au/referencing/harvard_system).

Late Penalty

See subject outline for late submission penalty, unless an extension has been approved by the subject coordinator.

Special Consideration

Special consideration, for late submission, must be arranged beforehand with the subject co-ordinator (**email: asif.gill@uts.edu.au**).

Please also see the UTS Special Consideration Process:
www.sau.uts.edu.au/assessment/consideration

Special Needs:

Students should email the subject coordinator as soon as possible (and prior to the assessment deadline) to make them aware of the impact on them meeting assessment component/requirements, and that they are seeking assistance through UTS Special Needs as detailed in Section 5.1.3 of Procedures for the Assessment of Coursework Subjects.

Academic Misconduct:

Please see the subject outline for plagiarism and academic integrity in conjunction with UTS policy and procedures for the assessment for coursework subjects.

Querying Marks/Grades and Final Results

See subject outline for details.