School of Information Technology

IT1166 / IT1566 / IT1666 / IT1866 / IT1966
App Development Project

Project Guidebook
AY2021 S2

1. Introduction

1.1 Aims

This module provides students with the practical experience of applying the concepts of object-oriented programming to develop software components that are maintainable and extensible. Students shall work in teams to develop, test and implement innovative and interactive applications to solve real life problems using Design Thinking methodology and Agile process.

1.2 Learning Outcome

At the end of this module, students will be able to:

- Explain and apply the concepts of classes, encapsulation, inheritance and polymorphism in object-oriented programming in software development.
- Apply the key concepts of object-oriented programming to construct maintainable and extensible software applications.
- Apply design thinking approach to create innovative and human-centric applications to solve real life problems.
- Plan and execute a project as a team iteratively and deliver the solutions in a timely manner according to the given requirements.

2. Project Scenario

2.1 Background

You are a group of creative, innovative, and energetic programmers who intend to drive the digital innovation of a company/industry by digitalising their existing businesses and creating an interactive and immersive online experience. Using Design Thinking methodology, each team shall come up with the project proposal/specification, create the design, and build the entire (web) application that can help the company/industry switch to digital.

Account management, transaction processing, customer support, and report generation are the general features of an application for two groups of users:

- Public / Customer

  This group shall do online transactions, submit enquiries and provide feedback. The customer interfaces are desktop PCs, kiosks and mobile devices (e.g. smartphones, tablets, etc.).

- Staff

  The staff shall do backend processing of transactions and generate reports for analysis to make critical decisions for the company. The staff interface is desktop PC based.

2.2 Company/Industry

- Choose one company or industry that your team would like to digitalise their business as part of their innovation drive.

2.3 Minimum Feature Requirements

- Must be web-based, primarily targeting desktop and laptop users.
- Must utilize Python classes and objects in the application.
- Must implement persistent storage for Python objects (e.g Shelve).
- Data validation to ensure data consistency must be performed.
- Information update operation must be performed via persistent storage (e.g Shelve).

2.4 Additional Features (where applicable)

- Features to enhance security of the application
- Interfaces for batch uploading of data
- Data visualization on data collected
- Alert notification on content changes monitoring

2.5 Tools and Technologies

The application framework for this project shall be Flask for building web applications with Python. Where appropriate, you may utilize additional development tools, such as JQUERY and Bootstrap.

3. Project Assessment

Project comprises 80% of the total module mark.

3.1 Assessment Components

Week	Deliverables	Individual	Group	Total
9	Proposal Presentation			20%
	- Presentation	5%		
	- Innovation		5%	
	- Prototype Proposal	5%	5%	
13	Progress Review	15%		15%
15	Technical Review	10%	5%	15%
18	Final Presentation			30%
	- Integration		10%	
	- Final Solution	10%		
	- Reflection	5%	5%	
		50%	30%	80%

3.2 Assessment Rubrics

Week 9 Proposal Presentation (20%)

	Group (10%)			
Category	Excellent (A)	Very Good (B)	Good (C)	Satisfactory (D)
Innovation (5%)	At least 4 business needs that require digital innovation by the company/industry, each with detailed analysis, description, and relevant key facts.	3 business needs that require digital innovation by the company/industry, each with detailed analysis, description, and relevant key facts.	2 business needs that require digital innovation by the company/industry, each with detailed analysis, description, and relevant key facts.	2 business needs that require digital innovation by the company/industry, each with some detailed analysis, description, and relevant key facts.
Proposal (5%)	Proposed functionality exhibits high level of empathy for user, and incorporate feasible, realistic, and practical workflow that value add to business needs and processes.	Proposed functionality exhibits good empathy for user and incorporated mostly feasible, realistic workflows that requires some fine tuning before it can value add to business needs and processes.	Proposed functionality exhibits low level of empathy for user, and incorporate workflow that requires substantial enhancement before it can value add to business needs and processes.	Proposed functionality exhibits little empathy for user, and incorporate workflow that requires weighty enhancement before it can value add to business needs and processes.

	Individual (10%)			
Category	Excellent (A)	Very Good (B)	Good (C)	Satisfactory (D)
Presentation (5%)	Presenter is well-groomed, very enthusiastic, speaks with excellent articulation/volume and confidence; always speaks in complete sentences that are easy to understand, follow and totally engaging.	Presenter is well-groomed, shows enthusiastic, speaks with good articulation, voice projection and confidence; speaks mostly in complete sentences and is easy to understand, follow and very engaging.	Presenter is groomed, shows enthusiastic, speaks with clear articulation, voice projection and confidence; often speaks in complete sentences and is easy to understand, follow and engaging.	Presenter shows little enthusiastic, speak with poor articulation and voice projection; rarely speaks in complete sentences and is not easy to understand, follow and engage.
Prototype (5%)	Wireframe design with complete details and consistency in meeting user needs.	Wireframe design with at least 75% complete details and consistency in meeting user needs.	Wireframe design with at least 60% complete details and consistency in meeting user needs.	Wireframe design with at least 50% complete details and consistency in meeting user needs.

Week 13 Progress Review (15%)

	Individual (15%)			
Category	Excellent (A)	Very Good (B)	Good (C)	Satisfactory (D)
Flask Application (10%)	Completed at least 4 functions (C, R, U and/or D) with excellent use of UI components, consistent layout and compellingly consideration to address the user's needs.	Completed 3 functions (C, R, U and/or D) with excellent use of UI components, consistent layout and compellingly consideration to address user's needs.	Completed 2 functions (C, R, U and/or D) with good use of UI components, consistent layout and good consideration to address user's needs.	Completed 1 function (C, R, U or D) with good use of UI components and good consideration to address user's needs.
Object-Oriented Programming (OOP) Concepts (5%)	Implemented 3 OO concepts appropriately and correctly with strong justification in supporting the functionality of the flask application.	Implemented 3 OO concepts appropriately and correctly with good justification in supporting the functionality of the flask application.	Implemented 2 OO concepts appropriately and correctly with good justification in supporting the functionality of the flask application.	Implemented 2 OO concepts appropriately and correctly with some justification in supporting the functionality of the flask application.
	OO Concepts: - Classes, Objects and Methods - Inheritance & Polymorphism - Persistence & Exceptions			

Week 15 Technical Review (15%)

	Group (5%)			
Category	Excellent (A)	Very Good (B)	Good (C)	Satisfactory (D)
User Interface Usability (5%)	Excellent use of bootstraps and navigation to create a consistent, responsive user interface with excellent usability.	Good use of bootstraps and navigation to create a consistent, responsive user interface with great usability.	Good use of bootstraps and navigation to create a mostly consistent user interface with decent usability.	Use of bootstraps and navigation to create a somewhat consistent user interface with average usability.

	Individual (10%)			
Category	Excellent (A)	Very Good (B)	Good (C)	Satisfactory (D)
Functionality (10%)	Completed at least 60% of the functionality that value add to business needs and processes with the ability to answer technical questions asked about how they work and explain advanced codes not taught in class.	Completed at least 50% of the functionality that value add to business needs and processes with the ability to answer technical questions asked about how they work.	Completed at least 30% of functionality including at least 3 functions (C, R, U and/or D) and at least 2 OO concepts implemented with the ability to explain the codes and answer most of the technical questions.	Completed at least 3 functions (C, R, U and/or D) with at least 2 OO concepts implemented with the ability to explain some of the codes and answer technical questions asked with some help.

Week 18 Final Presentation (30%)

	Group (15%)			
Category	Excellent (A)	Very Good (B)	Good (C)	Satisfactory (D)
Integration (10%)	All members' functionalities are fully integrated and with no error.	All members' functionalities are fully integrated and with 2 or less errors.	Integration attempt with 2 or less functions from member(s) are not integrated (to present on individual laptop).	More than 2 functions from members are not integrated and to present on individual laptop.
Reflection (5%)	Detailed examine, analysis, describe of group work with excellent value-add insight to improve learning.	Detailed examine, analysis, describe of group work with good value-add insight to improve learning.	Somewhat detailed examine, analysis, describe of group work with substantial value-add insight to improve learning.	Adequate examine, analysis, describe of group work with adequate value-add insight to improve learning.

	Individual (15%)			
Category	Excellent (A)	Very Good (B)	Good (C)	Satisfactory (D)
Solution (10%)	Excellent solution exhibits high level of empathy for user, and incorporate feasible, realistic, and practical workflow that value add to business needs and processes. Excellent solution demonstration with no error and test data set up for the entire demonstration.	Good solution exhibits good empathy for user and incorporated mostly feasible, realistic workflows that requires some fine tuning before it can value add to business needs and processes. Good solution demonstration with no error and test data set up for the entire demonstration.	Adequate solution exhibits adequate empathy for user, and incorporate workflow that requires substantial enhancement before it can value add to business needs and processes. Adequate solution demonstration with 2 or less errors.	Brief solution exhibits little empathy for user, and incorporate workflow that requires weighty enhancement before it can value add to business needs and processes. Solution demonstration with errors that required the solution to restart for the continuation of solution demonstration.
Reflection (5%)	Detailed examine, analysis, describe of personal reflection with excellent value-add insight to improve personal learning.	Detailed examine, analysis, describe of personal reflection with good value-add insight to improve personal learning.	Somewhat detailed examine, analysis, describe of personal reflection with substantial value-add insight to improve personal learning.	Adequate examine, analysis, describe of personal reflection with adequate value-add insight to improve personal learning.

~ End ~