
School of Information Technology

# IT1166 / IT1366 / IT1566 / IT1666 / IT1866 / IT1966
# App Development Project

Project Guidebook
AY2020 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 help the company/industry to address the business challenges arising from COVID-19. Using Design Thinking methodology, each team shall come up with the project specification, create the design, and build the entire (web) application that can help the company/industry through this challenging period.

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 address the business challenges faced by them arising from COVID-19.

## 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 utilize Shelve for implementing persistent storage for Python objects.
- Data validation to ensure data consistency must be performed.
- Information update operation must be performed via 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 70% of the total module mark.

### 3.1 Assessment Components

| Week | Deliverables | Individual | Group | Total |
|---|---|---|---|---|
| 6 | Proposal Presentation<br>- Presentation<br>- Business Challenges<br>- Prototype Proposal | <br>5%<br><br>5% | <br><br>5%<br>5% | 20% |
| 13 | Progress Review | 10% | | 10% |
| 15 | Technical Review<br>- Usability<br>- Functionality & OOP Concept | <br><br>10% | <br>5% | 15% |
| 18 | Final Presentation<br>- Integration<br>- Presentation & Final System | <br><br>20% | <br>5% | 25% |
| | | 50% | 20% | 70% |

3.2 Assessment Rubrics

Week 6 Proposal Presentation

| **Group (10%)** | | | | |
|---|---|---|---|---|
| Category | Poor | Satisfactory | Good | Excellent |
| Business Challenges (5%) | Provide little analysis, description and relevant key facts of the business challenges faced by the company/industry. | 2-3 business challenges each with some detailed analysis, description and relevant key facts faced by the company/industry. | 2-3 business challenges each with detailed analysis, description and relevant key facts faced by the company/industry. | At least 4 business challenges each with detailed analysis, description and relevant key facts faced by the company/industry. |
| Proposal (5%) | Provide little consideration in addressing the challenges faced. | 2-3 user stories each with some consideration in addressing the challenges faced. | 2-3 user stories each with compellingly consideration in addressing the challenges faced. | At least 4 user stories each with compellingly consideration in addressing the challenges faced. |

| **Individual (10%)** | | | | |
|---|---|---|---|---|
| Category | Poor | Satisfactory | Good | Excellent |
| Presentation (5%) | Presenter shows no preparation for the presentation, limited enthusiasm, speaks with monotone; rarely speaks in complete sentences and not easy to understand, follow and engage. | Presenter is groomed, shows enthusiasm, speaks with clear articulation, voice projection and confidence; often speaks in complete sentences and is easy to understand, follow and engaging. | Presenter is well-groomed, shows enthusiasm, speaks with good articulation, voice projection and confidence; speaks mostly in complete sentences and is easy to understand, follow and very engaging. | 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. |
| Prototype (5%) | Wireframe design with little details and consistency in meeting user needs. | Wireframe design with at least 50% 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 complete details and consistency in meeting user needs. |

Week 13 Progress Review

| **Individual (10%)** | | | | |
|---|---|---|---|---|
| Category | Poor | Satisfactory | Good | Excellent |
| Flask Application (5%) | Only 1 UI (C, R, U or D) with poor use of UI components and little consideration to address user's needs. | Completed 1 UI (C, R, U or D) with good use of UI components and good consideration to address user's needs. | Completed 2 UIs (C, R, U and/or D) with excellent use of UI components, consistent layout and compellingly consideration to address user's needs. | Completed 3 UIs (C, R, U and/or D) with excellent use of UI components, consistent layout and compellingly consideration to address user's needs. |
| Object-Oriented Programming (OOP) Concepts (5%) | Implement OO classes adequately with little justification in supporting the functionality of the application interface(s). | Implement OO classes adequately with some justification in supporting the functionality of the application interface(s). | Implement OO classes appropriately and correctly with good justification in supporting the functionality of the application interface(s). | Implement OO classes appropriately and correctly with strong justification in supporting the functionality of the application interface(s). |
| | OO Classes<br>- Class definition with data, class attributes, methods and, initializer<br>- Class access with encapsulation | | | |

Week 15 Technical Review

| **Group (5%)** | | | | |
|---|---|---|---|---|
| Category | Poor | Satisfactory | Good | Excellent |
| Usability (5%) | Inconsistent layout and poor accessibility of feature from the application. | Some consistent layout and satisfactory accessibility of feature from the application. | Consistent layout and good accessibility with 1 groupmate's features from the application. | Consistent layout and excellent accessibility with 2 groupmates' features from the application. |

| **Individual (10%)** | | | | |
|---|---|---|---|---|
| Category | Poor | Satisfactory | Good | Excellent |
| Functionality (5%) | Completed less than 2 CRUD functions. | Completed 2 CRUD functions. | Completed 3 CRUD functions. | Completed more than 3 CRUDs to support the functionality of the application in addressing the user's needs. |
| Object-Oriented Programming (OOP) Concepts (5%) | Implement less than adequate exception handling (more than 2 errors) and persistence storage with little justification in supporting the functionality of the application. | Implement adequate exception handling (at most 1 error) persistence storage with some justification in supporting the functionality of the application. | Implement comprehensive exception handling and persistence storage with good justification in supporting the functionality of the application. | Implement a comprehensive exception handling and persistence storage with strong justification in supporting the functionality of the application. |

Note: Students are expected to do technical walkthrough of their work during the technical review. Explaining and answering of questions related to their work/codes are expected.

Week 18 Final Presentation

| **Group (5%)** | | | | |
|---|---|---|---|---|
| Category | Poor | Satisfactory | Good | Excellent |
| Integration (5%) | Not integrated. Solution presented on individual laptop. | More than 1 functions are not integrated and integrated solution with some errors. | Only 1 function is not integrated and integrated solution with no error. | Fully integrated with no error. |

| **Individual (20%)** | | | | |
|---|---|---|---|---|
| Category | Poor | Satisfactory | Good | Excellent |
| Solution (15%) | Solution with 1-2 data validation methods and confusing flask navigation routing.<br><br>Solution is a standalone architecture with no integration with groupmates' solution.<br><br>Solution demonstration is not able to continue due to error(s). | Solution with 3-4 data validation methods and decent flask navigation routing.<br><br>Solution has only 1 integration with groupmates' solution to meet the functionality requirements of the application.<br><br>Some minor errors that required the solution to restart for the continuation of solution demonstration. | Solution with 3-4 data validation methods and logical flask navigation routing for users to progress effectively.<br><br>Solution has 2-3 integration with groupmates' solution to meet the functionality requirements of the application.<br><br>Good solution demonstration with no error and test data set up for the entire demonstration. | Solution with comprehensive use of data validation methods and logical flask navigation routing for users to progress effectively.<br><br>Solution architecture is fully integrated with groupmates' solution to meet the functionality requirements of the application.<br><br>Excellent solution demonstration with no error and test data set up for the entire demonstration. |
| Presentation (5%) | Present solution that is not clear and concise and audience has difficulty trying to understand and follow. | Present solution in a way that is not always clear and concise, and audience find it hard to understand and follow sometimes. | Present solution in a way that is partially clear and concise, audience can still understand and follow. | Presents solution clearly, concisely and logically, audience can easily understand and follow. |

**~ End ~**