



IS3106 – Enterprise Systems Interface Design and Development

AY 2019/20 Semester 2

Group Project

Objectives

At the completion of the group project, you should:

1. Develop a greater understanding of digital commerce from a business-to-consumer (B2C) perspective.
2. Write an effective report to communicate your idea to a suitable target audience, e.g., potential investors.
3. Acquire skills on enterprise front-end web and mobile applications development with a common backend that handles all business processing.

General Requirements

You are required to form a 4-member group to undertake a project on enterprise front-end applications development. If the final cohort enrolment size is not a multiple of 4, one or more groups may be allowed to have either 3 or 5 members.

The project is broadly divided into two different phases – an **ideation phase** and then follows by an **implementation phase**. From a design thinking perspective, ideation is the process in which you generate ideas and solutions through sketching, prototyping, brainstorming, brainwriting, worst possible idea, and other ideation techniques.

- **Ideation Phase** – Conceptualise a B2C digital commerce idea that has a well-defined business model. Your idea should ideally have a demonstrable revenue model such as sales revenue to be captured through online credit card payment, for example.
- **Implementation Phase** – Realise your idea by developing a fully functional prototype that incorporates at least two front-end applications. Your group may choose to develop either one of the two combinations of i) one web application and one mobile application; or ii) two web applications. The front-end applications must be thin clients that delegate actual business processing to a single common backend. The prototype must demonstrate the feasibility of your group's digital commerce idea.

The proposed idea must also be of an ethically and socially acceptable nature that is appropriate for an academic project.

Your group is required to submit a project proposal in Week 6 briefly describing your idea. The proposal will be assessed for the appropriateness of the idea and suitability for web and/or mobile application development. Actionable comments will be provided together with some constructive suggestions. If your proposal is not accepted, your group will need to revise and resubmit it latest by Week 8.

There are two scheduled project consultation sessions and all sessions are compulsory. If your group requires any further assistance, you are welcomed to contact the lecturer for additional consultations.

Your group will present your project on demo day during the 16th SoC Term Project Showcase (STePS) in Week 13 using a combination of oral presentation, poster presentation and prototype demonstration. The final project deliverables are due for submission at the end of Week 13 after STePS. The completed prototype must be deployed live on the virtual machine provisioned for your group.

Group Registration

Please register your group via LumiNUS – Class Groups. Do ensure that all members are registered in the same group.

You can use the LumiNUS Forum > Recruitment of Project Group Members for members recruitment. Please complete the group formation latest by the end of Week 4, i.e., **Sunday, 9 February 2020, 11:59 pm**. This would give your group sufficient time to prepare for the submission of the project proposal

Overall Assessment Criteria

The overall assessment criteria are listed below.

Project Proposal	3%
Peer Review (Individual)	1%
Final Project Deliverables	36%
• Written Report	8%
• Prototype	25%
• STePS Showcase	3%
Total	40%

The detailed assessment criteria for each component will be elaborated subsequently.

General Project Schedule

S/N	Week	Date	Activity	Remark
1	1	14 Jan	Release of project specification.	
2	4	9 Feb	Project group registration.	Done via LumiNUS by 11:59 pm
3	6	23 Feb	Submission of project proposal.	Done via LumiNUS by 11:59 pm

S/N	Week	Date	Activity	Remark
4	7	-	Project consultation 1 – Review of project proposal.	Details to be confirmed
5	10	-	Project consultation 2 – Progress update.	Details to be confirmed
6	13	TBC	Project demonstration @ STePS	
7	13	19 Apr	Submission of final project deliverables.	Done via LumiNUS by 11:59 pm
8	13	19 Apr	Submission of peer review form.	Done via LumiNUS by 11:59 pm

Project Proposal Requirements

The **project proposal** consists of two main sections. In the first section, provide a brief description of the proposed digital commerce idea that your group is working on and the business domain. In the second section, briefly outline the business model. Emphasis is placed on the value proposition, revenue model (if any), competitive environment and competitive advantage. Discussion on competitive environment and competitive advantage should take into consideration both online and offline competitors.

You may apply ideation techniques as desired, in particular visual tools such as storyboarding.

Please download the softcopy template from the LumiNUS Files tool and use it to prepare the proposal using Microsoft Word. Remember to complete the header information. The template is formatted based on the following settings:

- Paper size: A4
- Margins: 1 inch all around.
- Orientation: Portrait.
- Line Spacing: Double spacing.
- Font Type for Main Text: Times New Roman.
- Font Size for Main Text: 12 pt.
- Page Limit: There is no page limit. Please include references.
- File Format: DOCX. Do not convert the document into PDF.
- File Name: Name the file as “**GPXX.docx**” where “GPXX” is your group number that will be given to you during registration. If your group number is “GP01”, please name your document as “GP01.docx”.

The assessment criteria for the project proposal are listed below.

Appropriateness and Viability	2%
Overall Quality of Write Up (e.g., appropriate use of ideation techniques)	1%
Total	3%

Only the group leader should submit the project proposal via the LumiNUS Files tools: Deliverables Submission > Group Project - Proposal. The submission deadline for the project proposal is **Sunday, 23 February 2020, 11:59 pm.**

Written Report Requirements

The **written report** is intended to convey the business model of your final and refined digital commerce idea to potential investors, and also document the technical design of the completed enterprise system.

The written report must contain the following contents and formatted accordingly:

1. Cover page (include group number, and full name and matriculation number of all group members).
2. Table of contents.
3. Description of idea and its value proposition.
4. Main business content:
 - Revenue model.
 - Market opportunity.
 - Competitive environment.
 - Competitive advantage.
 - Marketing and advertising strategies.
5. Main technical content:
 - One UML use case diagram depicting business use cases for each of the common backend, front-end application 1 and front-end application 2. Total of three use case diagrams.
 - One UML class diagram depicting the logical data model of the enterprise system.
 - One UML component diagram depicting all Java EE components in the enterprise system together with their provided and required interfaces.
 - One of set of prototype description write-up and sample screenshots for each of the front-end application 1 and front-end application 2. Total of two sets.
6. References (if any)
7. Appendices (if any)

Please format the written report based on the following settings:

- Paper size: A4
- Margins: 1 inch all around.
- Orientation: Portrait.
- Line Spacing: Double spacing.
- Font Type for Main Text: Times New Roman.
- Font Size for Main Text: 12 pt.
- Page Limit: There is no page limit. Please include references.
- File Format: DOCX. Do not convert the document into PDF.
- File Name: Name the file as “**GPXX.docx**” where “GPXX” is your group number that will be given to you during registration. If your group number is “GP01”, please name your document as “GP01.docx”.

The assessment criteria for the evaluation of the written report are listed below.

Description and Value Proposition	10%
Main Business Content	20%
Main Technical Content	60%
Overall Quality of Write Up	10%
Total	100%

Prototype Requirements

The **prototype** is intended to demonstrate the operational/commercial feasibility of your digital commerce idea to potential investors. It should help the audiences to visualise how the idea will be realised in the real-world to the maximum extent possible. A fully functional prototype is required. The prototype must consist of:

- A single common backend.
- Two front-end applications.
- Both the common backend and front-end applications are to be hosted on the virtual machine provisioned.

Your group's prototype must conform to the following technical requirements:

1. Backend development must be done with Java EE.
2. Front-end development must be done with:
 - a. Server-side processing – Java stack:
 - i. Java Servlet and JavaServer Pages (JSP).
 - ii. JavaServer Faces (JSF).
 - b. Client-side processing – JavaScript/TypeScript stack:
 - i. Angular.
 - ii. Ionic (hybrid mobile application).

You are required to use **TWO** different stacks, one for each of the two front-end applications. Within each stack, you can choose any one of the available development options.

3. The recommended application server is GlassFish for Java EE.
4. Appropriate software architecture must be adopted for the entire project. For the front-end applications, you must use either MVC or MVVM depending on the chosen development options. The common backend must adopt component-based architecture and Service-oriented Architecture (SOA). The overall enterprise software system must exhibit a multitier architecture with thin clients.
5. A relational database must be used to store data processed by the prototype permanently through the use of an appropriate object/relational mapping (ORM) technology, i.e., Java Persistence API.

In terms of user interface (UI)/user experience (UX), emphasis is placed on the functional aspects and less so of the aesthetics aspects. However, please ensure that the web and mobile applications look aesthetically pleasing to the eyes. For instance, appropriate colour scheme, font and layout should be used.

The assessment criteria for the prototype are listed below.

Functional Breadth Sufficiency of the actual functionalities implemented.	40%
Functional Depth Relative complexity of the actual functionalities implemented.	30%
User Interface – Functional Aspects Ease of interactivity and navigability of the front-end applications.	20%
User Interface – Aesthetic Aspects Aesthetic look and feel of the front-end applications.	10%
Total	100%

Project Deliverables Submission

The final project deliverables to be submitted to the LumiNUS Files tool in Week 13 are to be placed in a single zip archive file with the following folders structure:

- **docs** subfolder containing:
 - A softcopy of your written report in Microsoft Word DOCX format named with your group number.
- **source** subfolder containing:
 - All project folders/files that constitute your group's prototype.
- **bin** subfolder containing:
 - All binary or executable files that constitute your group's prototype (e.g., APK or IPA file for mobile app).
- **data** subfolder containing:
 - A script file that contains the statements/commands to recreate the database.
 - The script file must contain some test data.
 - If your group uses code to load the test data, leave this subfolder empty.
- **readme.txt** containing:
 - Group number.
 - Full name, matriculation number, email and contact number of all group members. Please indicate the group leader.
 - Detailed instructions for accessing/running the prototype as deployed on your group's virtual machine. In particular, the required URLs should be provided.

Upload this zip archive file to the designated LumiNUS Files tool folder: "Deliverables Submission > Group Project - Deliverables". This is to be done by the group leader only. Name the file as "**GPXX.zip**" where "GPXX" is your group number that will be given to you during registration. In addition, the group leader is to deploy the prototype to the virtual machine provisioned.

Your group's deliverables must be submitted latest by **Sunday, 19 April 2020, 11:59 pm**. No project will be accepted for assessment after this date/time and your group will be awarded **0**

marks. In addition, please take note that the LumiNUS Files tool submission folder will be closed after the submission date/time. You are not allowed to change the source and binary files on the virtual machine after the submission date/time.

If the zip archive file size exceeds the upload limit of the LumiNUS Files tool, please place it in a removable storage medium such as CD/DVD-R or thumbdrive and pass them over to the lecturer physically.

Presentation Requirements

Your group will demonstrate your project during the 16th STePS. The actual date of the 16th STePS will be announced as soon as it has been confirmed. STePS allows the use of mixed-modes presentation including oral, poster and prototype demonstration. Your group may use any visual aids as desired, including a slides deck or video. An oral defence will be conducted during STePS itself. Your group members are expected to answer all questions satisfactorily. STePS also has a popular voting exercise to choose the most well received project for the module.

Your group is allowed to revise your written report and/or prototype (if any) to address the comments and suggestions that you receive during STePS. In this regard, you are advised to submit your final project deliverables after STePS.

The assessment criteria for the evaluation of the STePS presentation are listed below.

Oral Defence	40%
Popular Vote	60%
Total	100%

Peer Review Requirements

At the end of the semester in Week 13, each member is required to submit an individual peer review form. You will be given 1% (out of the overall 40%) for a fully completed peer review form. Feedback provided in the peer review will be taken seriously and you may not be given the team grade for the group project if you receive consistent negative review from your peers.

For the peer review form, please download the softcopy template from the LumiNUS File tools folder: Assignments > Group Project. The submission deadline for the peer review form is **Sunday, 19 April 2020, 11:59 pm**. The peer review form should be completed at the individual level and submitted via the LumiNUS Files tool folder: Deliverables Submission > Group Project - Peer Review. Name the file as “**GPXX_YYYYYYYYYY.docx**” where “GPXX” is your group number that will be given to you during registration and “YYYYYYYYYY” is your matriculation number.

Plagiarism and Academic Honesty

The University takes a serious view against any forms of plagiarism. Please refer to the NUS Plagiarism Notice (<http://www.comp.nus.edu.sg/cug/plagiarism>) for more information. All submitted deliverables will be subjected to a plagiarism check.

Any group or individual student who is found guilty of committing an act of academic dishonesty, e.g., plagiarism or soliciting external help, will be severely dealt with. Your group or you may be given a **FAIL** grade.

References and Citations in Your Project

All materials sourced externally for the project proposal and written report must be properly cited and referenced. The references and citations should follow the MISQ Style.

In-text citations must be used in the main contents of the proposal and business plan/report when citing any materials from external sources. The format for in-text citations is:

- Single author: (Tan 2009)
- Two authors: (Tan and Lim 2009)
- More than two authors: (Tan et al. 2009)

The full references for all cited materials should be placed in a separate references section. The format for the references is:

- **Journal article:** Burke, K. and Chidambaram, L. “How Much Bandwidth is Enough? A Longitudinal Examination of Media Characteristics and Group Outcomes,” *MIS Quarterly* (23:4), December 1999, pp. 557-580.
- **Conference proceeding:** Chen, X., Siau, K. and Nah, F. F. “Adoption of 3-D Virtual Worlds for Education,” in *Proceedings of the 29th International Conference on Information Systems*, Paris, 2008, pp. 1-12.
- **Book:** Short, J., Williams, E. and Christie, B. *The Social Psychology of Telecommunications*, Wiley, London, England, 1976.
- **Chapter in book:** Daft, R. L. and Lengel, R. H. “Information Richness: A New Approach to Managerial Behavior and Organizational Design,” in *Research in Organizational Behavior (Vol. 6)*, Cummings, L. L. and Staw, B. M. (Eds.), JAI Press, Homewood, IL, 1984, pp. 191-233.
- **Internet resource:** Sifry, D. “The State of the Live Web, April 2007”, *Sifry’s Alert* [Online], April 05, 2007, accessed at <http://www.sifry.com> on March 12, 2008.

-- End of Group Project Specification --