University of Wollongong

School of Computing and Information Technology

CSCI927/427 Service-Oriented Software Engineering

Spring 2024

Group Project (40 marks)

TASKS

Your tasks are to:

1. ***Form a group of 6 people ASAP by the end of Week 2 and register your group via a link on Moodle, and start working on the project.***
2. Structure your group, allocating roles and responsibilities to your members.
3. Organize **weekly group meetings**. Each group must have **at least one meeting** per week.
4. Complete the design and development of the project described below using service-oriented software engineering.
5. Make sure your group **makes progress on the project every week.** Note that this is the scope of a 10-week project. If your group doesn't make progress every week and delays project work to the last weeks or days, there is a very high risk of project failures.
6. *Attend your group meetings, respond promptly to your team communication, actively participate in discussions, and contribute significantly to your group's work.* ***Each team member's contribution should be recorded in the final report.*** *If you have little contribution to your group project, your individual mark will be significantly lower than your group's mark (or even 0 mark if you have almost no contribution).*
7. Produce a report detailing the group's work.

MILESTONES/SUBMISSION

1. Progress checkpoints in the tutorials in Week 4 and Week 8 (not graded)
2. Final deliverables (softcopy to Moodle) (36 marks) **Week 12**
   - Final report
   - Executable system + source code
3. Project presentation and demonstration (4 marks) **Week 12**
4. **True** weekly meeting reports from Week 3 to Week 12 (submit to Moodle **every Monday** from Week 3, **at least one meeting report per week**). **Weekly meeting reports** should cover at least the following:

- **Member contribution report** up to that week (see details below for what should be included in the member contribution)
- **True** (**the meeting must occur**) group meeting records: agendas and meeting minutes which include at least the following: **group ID, student ID, meeting date, attendance, progress reports of each week, review and tracking, discussion summaries, and action plans/items**.

GUIDELINES

1. **Progress checkpoints** in the tutorials in Week 4 and Week 8:
   - All students must attend the project checkpoints online or in the lecture/tutorial location.
   - The subject coordinator will check the submitted weekly meeting reports and provide some feedback/advice to the groups.
   - A Q&A session will be conducted. Group members are encouraged to submit their questions (e.g., to the Moodle forum) before the session.

2. The **final report** should cover at least the following artefacts related to the design and development of the project described below using service-oriented software engineering. Refer to the **Project Description section** below for the service platform that you need to design and develop.
   It is strongly recommended that all group members work on the same part together (e.g. all group members work on Part A together, then Part B together, etc.) so that everyone can learn from doing the tasks. These are important for exam preparation.

   A. Service identification and specification

   i. Identify at least 5 service providers. For each service provider, identify at least 3 services.

   ii. Specify those services using the Business Service Representation Language.

   B. Enterprise Architecture (EA) Design using ArchiMate

   i. Your EA design needs to cover at least three layers in ArchiMate: Business Layer, Application Layer, and Technology Layer.

   C. Business Process Design and Analysis

   i. Develop at least 5 realistic process models in BPMN for the services provided through this platform. You need to demonstrate the use of a wide range of BPMN elements discussed in the subject. You need to provide the sources from which you developed the process model – these might involve documents you found on the web, procedure manuals and so on. There must be clear evidence that your BPMN process model encodes process descriptions contained in these textual resources.

ii. Use the semantic effect annotation technique for business process models based on the ProcessSEER technology discussed in the subject to annotate this model. Effect annotations must be written in both English and first-order logic. You need to provide both the immediate effects of tasks/activities and the cumulative effect scenarios obtained at various points in the process. You need to present the annotations both as text annotations on your BPMN models and on separate pages of text to process model (in the latter case, use a numbering or indexing scheme to correlate annotations to various points in the process model).

D. Service Design and Analysis using SoaML

i. Conduct service design and analysis for your platform using SoaML (based on the service participants and service providers you identified in Part A). Your design should cover at least service architectures, service interfaces, service contracts (including their behaviour), and service compositions.

E. Microservices design and implementation

i. Select at least 3 services from your platform, and design and implement them using the microservices approach.

ii. Clearly demonstrate your design and implementation in the report.

F. Service/process analytics

i. Select at least 3 business processes (in Part C) from your platform and execute them to generate event logs. For process execution, you can write your own simulation or use an existing process execution engine.

ii. Use appropriate process mining tools to perform process mining and analytics on these event logs.

iii. Clearly demonstrate how all of the above tasks were performed in details and their outcomes.

G. Member contribution for the whole project (with each member's signature)

Member contribution report (each deliverable, including the weekly meeting report, must be accompanied with a member contribution report):

- On the cover page of your group's report, you need to provide **rating** for the contribution of each team member and a **detailed explanation** **of what the team member did for the project** to justify the rating.
- Everyone in the team should write a statement "***I agree with my group member contribution report and ratings***" and **insert their signature next to the statement**. **Do NOT insert the signature of your group member without their consent/agreement.**
- The individual contribution of each team member is assessed by all the other members.
- The rating scale can be a **specific percentage number** (e.g. 40%, 60%, 80%, etc.). Alternatively, it can be rated into one of the three scales: "contributed", "very little", and "almost no contribution". For a team member who has "contributed", he/she will receive 100%

of the group mark; for a team member who contributed “very little”, he/she will receive 50% of the team mark; for students who made “almost no contribution”, he/she will receive 0 marks for the entire group project. Your tutor/lecturer may make adjustment to this marking criterion based on practical situations. The maximum mark that a group member can get is their group’s mark.

PLEASE READ THIS CAREFULLY: All work should be completed **independently** by your group. Plagiarism may result in a FAIL grade and are subject to the University Academic Misconduct Procedures. If any part (including sentences, figures/diagrams, tables, definitions, descriptions, and so on) in your work are copied from other people's work (including both published and unpublished papers, reports, Web articles, etc.), or if any idea is from other people, such work or people must be acknowledged explicitly. You should avoid “copy and paste” sentences from other people’s work to your work. In a rare case, where you must do so, you should use quotation marks to quote the copied sentences and make a citation next to the quoted text.

Project Description

Important Notes:

- *This Project Description provides **only** the **high-level goals** of this project. The team is responsible for eliciting more detailed and specific requirements based on these goals. The team is also encouraged to make assumptions and propose additional details or services/providers as needed. Time will be allocated in the lectures and tutorials for answering questions regarding the project.*

The project focuses on developing a comprehensive Tourism Ecosystem aimed at revolutionizing the tourism industry. The ecosystem integrates advanced technologies such as AI, and mobile applications to create a seamless and personalised tourism experience. The platform will consist of multiple services offered by different service providers, catering to various aspects of the tourism experience, from visitor information services to personalised recommendations and digital transactions.

For instance, the Tourism Information Center (TIC) offers Visitor Information, Tour Bookings, and Event Notifications. Local Attractions and Museums (LAM) handle Ticket Reservations, Guided Tours, and Educational Content Delivery. Accommodation Providers (AP) manage Room Bookings, Guest Services, and Feedback and Reviews. Restaurants and Cafes (RC) offer Table Reservations, Menu Recommendations, and Online Ordering. Local Transportation Services (LTS) provide Ride Bookings, Route Planning, and Real-Time Traffic Information. Additionally, Event Organizers (EO) handle Event Scheduling, Venue Bookings, and Event Promotion. Retail Shops (RS) offer Product Recommendations, Discount Notifications, and In-Store Navigation. Finally, Outdoor Activity Centers (OAC) provide Equipment Rentals, Adventure Sports Booking, and Safety Briefings. These diverse services ensure a comprehensive and enriched tourism experience.

CSCI927/427 Service-Oriented Software Architecture

Final Project Deliverable and Product Demonstration (Worth 40%)

Group:

Component	*Out of*	*Marks*	*Comments*
Project Presentation and Demonstration	*4*		
Final Deliverables			
Overall quality of the final deliverables (e.g. presentation, consistencies, sophistication of solutions, etc.)	*4*		
Service identification and specification	*5*		
Enterprise architecture design	*5*		
Business process design and analysis	*5*		
Service design and analysis	*5*		
Microservices design and implementation	*5*		
Service analytics	*5*		
Overall project management (e.g. observed progress, meeting records, etc.)	*2*		
Total	***40***		