

## INFO8231 Systems Development: Concepts & Analysis Assignment 3

This assignment is a continuation of **A1** and **A2**. **INFO8231 A1 rules** will apply.

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### Before you begin:

#### In MS Teams:

- ☐ Download the **A3\_ITCPA\_TeamYY\_Template.docx** from **eConestoga** and copy to your team's **General\A3** folder on your MS Teams **Files** tab.
- ☐ Rename your document to **A3\_ITCPA\_Team#.docx**
  - Put your entire **A3 solution** in this single **MS Word** document.
- ☐ Fill out the **Assignment 3 header** with your section, team # and student names.

*Reminder: Team members must sign their own name.*

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### A. Individual Requirement

- ☐ Complete the Visual Paradigm tutorial: **Lab\_DomainClassDiagram.pdf** and **Lab\_StateMachineDiagram.pdf**.
- ☐ Read and study the **ITCPA Case Study** documents in **A1**.
- ☐ To get started, use the event table, use case diagram and related background information from **A1** and **A2**. Below is a fictitious example of a student team that was selected to work with an external client project.
  - IT Program: CPA (Computer Programming and Analysis)
  - Course Code: INFO3220
  - School Term: Winter 2023
  - Client Name: Peter S.
  - Project Name: Service Dog Handler App
  - Team ID: W23-CPA-11
  - Team Name: K9 Care
  - Team members: John K. (CPA), Justin P. (CPA), Mary H. (ITID)
  - Faculty Advisor: Ted Tanner

*Tip: All the above sample data must be “remembered” by the system. You can add information that is relevant to the system. However, you must not manufacture any new information that does not support the ITCPA case study.*

## B. Team Assignment 3

You are working with the **IT Capstone Project Approval (ITCPA)** system case study. The major subsystems of the proposed solution have been reorganized as follows:

- Student Team Management Subsystem (**STMS**)
- Capstone Project Matching Subsystem (**CPMS**) – After a detailed review of the **ITCPA** events and use cases, the External Client Proposal Subsystem (**ECPS**) is now part of **CPMS**.

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### Task 1: Class Attribute Table

#### Task 1A: Student Team Management Subsystem (**STMS**)

□ Identify the domain classes and attributes for ITCPA **STMS** and fill out the **Class Attribute** table below.

Additional background information for **STMS**:

- A student team can have exactly one faculty advisor
- A student team can have 3 to 4 student team members
  - A special approval is required for a team to have over 3 members
  - A special approval is required for a student team to have members that come from multiple IT programs (e.g., CPA and ITID members in one team)
- A student team can belong to exactly one base IT program (e.g., CPA)
- The program coordinator (PC) manages one or more IT programs (e.g., CPA, CP)

*Optional: You can clarify the classes and attributes by constructing a Class-Attribute-Values (**C-A-V**) table. See sample **C-A-V** table for RMO Customer 101, 102 and 103 from your Chapter 4 slides.*

Class	Attribute	Synonym (optional)
Student		
	studentID {key}	
	...	
StudentTeam		
	teamID {key}	
	...	
...		

**Class Attribute Table 1**

### Task 1B: Capstone Project Matching Subsystem (CPMS)

□ Identify the domain classes and attributes for ITCPA **CPMS** and fill out the **Class Attribute** table below.

Additional background information for **CPMS**:

- An external client can propose multiple projects.
- A client project can have multiple student team applications, but only 1 student team will be selected to work with an external client.
- An external client can provide multiple project files to a client project.
- A student team can register or apply to client projects that are still available.
- A student team can provide multiple project application files (e.g., resumes of student members) to a client project.

Class	Attribute	Synonym (optional)
Project		Proposal
	projectName	
	...	
StudentTeamProjectApplication		ProjectApplication
	applicationDate	
	...	
...		

**Class Attribute Table 2**

□ Review both **Class Attribute** tables from Task 1A and 1B and resolve any duplicate classes.

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### Task 2: ITCPA Domain Class Diagram (DCD)

□ Based on the domain classes and attributes you identified in Task 1 above, draw a **Domain Class Diagram (DCD)** showing domain classes, attributes and associations with multiplicity. Start your **DCD** by adding **Student**, **StudentTeam**, **Project** and **StudentTeamProjectApplication** classes.

*Tip: You can make reasonable assumptions for associations and multiplicities as long as they do not contradict the background information provided. Add the identifier (i.e., {key}), as needed. PKs and FKs are not part of a class diagram.*

*Optional: You can clarify the associations and multiplicities by constructing a Semantic Net or UML object diagram(s). See sample Semantic Net for RMO Customer-Order-OrderItem ERD from your Chapter 4 slides.*

- Your **DCD** solution must identify at least one aggregation. *Hint: A project can have multiple project files.*
  - Your **DCD** solution must identify at least one class hierarchy. *Hint: Review all your classes and find common attributes and/or common associations that can be grouped into a “base class” or “superclass”.*
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### Tips for DCD:

- Review the **DCD** for some possible overlap with the list of classes and attributes from Task 1A and Task 1B **Class Attribute** tables.
    - Resolve duplicate classes/ attributes, if any (e.g., StudentTeamProjectApplication vs. ProjectApplication)
    - Add missing classes and attributes
      - *Hint: business transactions must have a transaction date and time*
    - Remove redundant attributes (e.g., those that represent associations)
    - Add associations and multiplicity, as needed
    - Remove any redundant associations (e.g., those that represent indirect associations)
    - *Review and revise your solution.*
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## Task 3: StudentTeamProjectApplication Object Life Cycle

### Task 3A: ITCPA StudentTeamProjectApplication State Table

- Identify the relevant states of the **StudentTeamProjectApplication** object life cycle (see all related **ITCPA** Background Information and fill out the **state table**).

Additional background information:

- A student team can apply to a client project that is still available.
- A student team can provide project application files or make changes to project application files only when in “**draft**” mode.
- Once a student team submits a project application, it is set to “**registered**” mode.
- If a student team cancels a project application that is in “draft” mode, it is set to “cancelled” mode.
- A client can either select, decline (i.e., “**declined**” reason is optional) or do nothing with a project application. For one client project, a maximum of one project application can be selected (i.e., “**matched**” mode). Two weeks (14 days) after the project application is in “**registered**” mode, it is automatically set to “**expired**”.

- The PC will review “**matched**” project applications and either “**confirmed**” or “**rejected**” (i.e., reason to reject must be provided). If the PC failed to review within 3 days, it will be set to “**confirmed**” automatically.

State ID	State Name	Transition Causing Exit
S01	Draft	Application is submitted, ...
	...	

**State Table for StudentTeamProjectApplication**

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### Task 3B: ITCPA **StudentTeamProjectApplication** State Machine Diagram

- ☐ Based on the **state table** above, draw a **State Machine Diagram (SMD)**. Your diagram must include states, transitions with events, actions and/or guard conditions, as appropriate.
  - ☐ Include the **State ID** in your **SMD**.
  - ☐ Iterate Task 1, Task 2 and Task 3 above until they are all complete and consistent.
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### Reminders:

- ☐ Copy the **class diagram** and **state machine diagram** to your solution document **A3\_ITCPA\_Team#.docx**.
  - ☐ **Checkpoint:** Use the **A3 marking sheet** to self-evaluate your team solution.
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### Submission Requirements:

- ☐ Submit your docx and vpp solution files to the **Assignment Dropbox** on **eConestoga** (i.e., **A3\_Team**).