Foreword

All assignments of this course are parts of one single project. Laboratory 1-4 – theoretical part, 5 – practical.

Thus, the results of laboratory work should be consistent with each other (old assignments may have issues with it) and be parts of a one single report.

Lab 1. IDEF

Objective: To explore the possibilities to describe the requirements for the designed software

Tasks

1. Create valid IDEF0 diagrams for the general company processes up to 3d level detailing. At 3d decomposition level should be at least one process with at least two actors collaboration.

2. Add IDEF0 diagrams images to doc report.

For IDEF0 diagram plotting you can use:

- https://app.diagrams.net/ (ex. draw.io)
- Draw.io desktop (https://github.com/jgraph/drawio-desktop/releases) for your Linux, Mac or Windows
- Ramus Educational (https://github.com/Vitaliy-Yakovchuk/ramus). Looks like dead and does not work with modern JRE.
- Microsoft Visio (non-Free).
- Another available software tools (Libre Office Impress, draw.io, etc.).

Notice

You have to prepare at least 4 diagrams: A-0, A0, 2 or more decomposed A0 blocks.

Model level	
0	Top level A-0, one block. Arrows show object connection with environment.
1	A0. First level, contain top processes.
2	Second level, top processes decompositions. You have to show at least 2 decomposed A0 blocks.

References

1. IDEF0 https://en.wikipedia.org/wiki/IDEF0

2. FIPS PUB 183, Integration Definition for Function Modeling (IDEF0), National Institute for Standards and Technology, December 1993. https://nvlpubs.nist.gov/nistpubs/Legacy/FIPS/fipspub183.pdf

3. ISO/IEC/IEEE 31320-1:2012(en) Information technology — Modeling Languages — Part 1: Syntax and Semantics for IDEF0 https://www.iso.org/obp/ui/#iso:std:iso-iec-ieee:31320:-1:ed-1:v1:en

Lab 2. Specification of system requirements. Use Case diagram. Scenarios

Objective: To study the basic features for creating and editing use case diagrams

Tasks

1. Choose one of the company type from the excel list or use your own company type. In the course of the assignments, you will have to describe and suggest some business processes automating of the selected company.

2. Define list of high-level customer's needs, which going to be solved by the information system implementation. Not less than 5 use cases in list.

3. Create Glossary of subject domain terms, which you will use next.

4. Create Use Case diagram for the described use cases. Diagram should include situation with at least two actors collaboration. Create Use Case diagram image (png/jpeg/gif).
Add image to doc report (see template in https://github.com/j-avdeev/EnterpriseSystemsDevelopment/tree/2021/Assignment%20Reports%20Template)

5. Write scenario for each use case using template: use case name, actors, goal, short description, basic script, exceptions (if exist).

6. Complete scenarios with examples of Screen forms, Documents to be created by your information system. For example, Registration Form, Acceptance Form, Bill screen, Internet invoice, Order in the online store, Medical services bill, etc.

Notice

For UML diagram plotting you can use draw.io (https://app.diagrams.net/ or Desktop client: https://github.com/jgraph/drawio-desktop), StarUML (http://staruml.io/) or another available software tools.

Lab 3. Business Process Model and Notation (BPMN) diagram

Objective: To study the basic features to create and edit BPMN diagrams

Tasks

1. Create BPMN diagram for general business process, which your application working with. This process must include collaboration of at least 2 actors. Use BPMN notation (http://www.bpmn.org/)

2. Add BPMN diagram image to doc report.

Notice

For BPMN diagram plotting you can use draw.io (https://app.diagrams.net/ or Desktop client: https://github.com/jgraph/drawio-desktop), Bizagi Modeler (http://www.bizagi.com/en/products/bpm-suite/modeler) or another available software tools

Lab 4. Sequence, State, Activity diagrams

Objective: To study the basics of Sequence, State, Activity diagrams

Addison Wesley - UML Distilled, 3rd Ed - 2003: "You should use sequence diagrams when you want to look at the behavior of several objects within a single use case. Sequence diagrams are good at showing collaborations among the objects; they are not so good at precise definition of the behavior. If you want to look at the behavior of a single object across many use cases, use a state diagram (see Chapter 10). If you want to look at behavior across many use cases or many threads, consider an activity diagram (see Chapter 11).

If you want to explore multiple alternative interactions quickly, you may be better off with CRC cards, as that avoids a lot of drawing and erasing. It's often handy to have a CRC card session to explore design alternatives and then use sequence diagrams to capture any interactions that you want to refer to later."

Tasks

1. Choose use case (use your Lab2 report) and create Sequence diagram for it.

2. Choose some object (or class) in your app and describe it behavior states change with State diagram. (Many people find that UI and control objects have the kind of behavior that is useful to depict with a State diagram).

3. Choose some process (or sub-process) and describe it with Activity diagram.

3. Compile resulting diagram images to doc report.

Notice

Grady Booch, James Rumbaugh, Ivar Jacobson Unified Modeling Language User Guide

Lab 5. Class diagram

Objective: To study the basic features for creating and editing class diagrams

Tasks

1. Study the possibility of describing the static structure of the information system. Learn how to allocate in the system of the basic classes and describe their properties and behavior. Create Class diagram. Describe at least 5 classes with relations.

2. Add Class diagram image to doc report.

3. Add table with comments:

Class name	Attributes/Methods	Data type/Comment about method assigment
Class1	Attribute1	Char[100]
	Method1	This method adds new list…
	…	

Lab 6. Business process implementation

Objective: To study the business process implementation with Cuba Platform

Tasks

1. Create Cuba Platform project, which will implement one of business processes of previously selected organization.

2. Add section to doc report image, which should include:

- Selected business process description (several sentences). It is desirable that the business process be the same as business process described in previous assignment.

- Instructions how to run application, prerequisites.

- Step-by-step instruction with demonstration of business process automation using the application.

3. Send zipped files and doc report to j-avdeev@yandex.ru

Notice

Use Cuba Platform documentation (for example https://doc.cuba-platform.com/bpm-latest/bpm.html or https://doc.cuba-platform.com/bpm-latest-ru/bpm.html (on Russian)).

Yes, can use your preferable framework (not Cuba Platform) to create a web application to automate chosen business process.