# EPTN 2016 Project Description

Mestrado em Engenharia Informática e Computadores
Department of Computer Science and Engineering
Instituto Superior Técnico, Universidade de Lisboa
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## 1 TASK

Your assignment is to design and to propose a "to be" business process model for a Pharmacy Prescription Fulfilment Process. A description of the "as is" process and the issues identified in this process can be found in the case study *Pharmacy Service Improvement at CVS* (11 pages) that was handed to you. In some places, the case study description is not detailed enough. In these cases, you can make your own assumptions, which must be fully presented in the project report.

First of all, you are asked to assess the possible benefits of improving this business process (this is called an "Opportunity Assessment"). To this end, you are asked to answer the following question:

- What revenue improvement could be obtained by reducing the defection rate due to poor customer service by 60%?

In order to answer this question, you may need to analyse the following questions first:

- What percentage of defecting customers in 2000 are light users? Same question for heavy users.
- What is the volume of scripts lost annually to light defectors? Same question for heavy defectors?
- How many scripts are filled annually by CVS pharmacies?
- What is the average revenue per script?

Next, you need to understand the "as is" process model. To this end, you are asked to design a detailed BPMN process model for the prescription fulfilment process. This process model should not only deal with the "normal course" of action, but it should also show how different types of errors or exceptions are handled, including:

- What happens if a customer calls to cancel their prescription or to change the time at which they plan to pick-up their prescription?
- What happens if the required drugs are not on stock? (Note: in some cases, the missing drug may be available in a nearby pharmacy).
- What happens if a customer does not come to pick up his/her prescription for several days?
- What happens if the maximum number of refills has been reached and the doctor who issued the prescription needs to be called in order to authorize an additional refill – but the doctor is unavailable?
- Other errors documented in the case study.

As a third step, you are requested to document the most important issues in an issue register and to assess the impact of these issues. This analysis should be documented in the form of an "issue register" including the following columns: Issue Priority Number, Issue Name, Short Description, Assumptions, Quantitative Impact and Qualitative Impact. You do not need to make an exhaustive issue register with every possible issue you can think of. Instead, you should include only the most "important" issues. For the quantitative impact analysis, you can use the estimates obtained in the opportunity assessment.

You should also analyse quantitatively the prescription fulfilment process at a typical pharmacy store. A typical store handles around 200 prescriptions in a given workday, out of which 90 are dropped off between 8am and 9am, and 120 prescriptions are picked up between 5pm and 7pm. The remaining prescriptions are dropped off and picked up more or less uniformly throughout the day. A typical store is open from 8am to 8pm and is generally staffed by two technicians (three technicians during the afternoon peak time) and one pharmacist at any given point in time. In the "as is" situation, an average drop-off takes 60 seconds and an average pick-up takes 160 seconds. Average execution times for the key activities in the process are as follows. Data entry takes

60 seconds per script; collection of drugs from the shelves 120 seconds; quality check 60 seconds (in 2% of cases the collection of drugs and the quality check need to be repeated due to issues detected by the pharmacist); Manual resolution of a problem arising during automated insurance check takes 120 seconds on average (with a lot of variance); manual resolution of a DUR hard stop takes 60 seconds (when the pharmacist can resolve it without involving the prescribing doctor) and 10 minutes when involvement from the doctor is required.

Based on the identified issues, you should then propose changes to the "as is" process and design a "to-be" process model based on these proposed changes. Each proposed change should be explained and justified in light of the issues identified before and where applicable, the benefits of the change(s) should be quantified in terms of time savings for customers or higher customer retention (or preferably) in terms of expected revenue or profit increase. When proposing changes, remember that ultimately, the goal is to increase revenue. Improving customer satisfaction is one way to achieve this goal. Other process changes that help to bring in customers into the pharmacy should also be considered.

Next, you are requested to perform a simulation of the to-be process model to sustain the expected benefits. Model the to-be process in a process modelling/simulation tool (ex Bizagi modeller) and present a small description of the simulation and its results. The simulation should include roles and the expected number of participants for each role.

Finally, you are requested to present a process model automation. To explain how the to-be process could be automated, you are requested to present:

- The process model enriched with the details necessary to automation. For example, tasks must be typified according to the correct BPMN subtypes (as for example *manual*, *user automated* tasks, etc.).
- The data fields required for each task. For *automated* tasks, present the input and output data fields and how the former are used to compute the latter. For *user* tasks, present the corresponding data fields that are presented and/or changed together to the user.
- The data model. Consider a data model to be a set of entities (customer, prescriptions, etc.), where each entity aggregates a set of attributes (the corresponding data fields) and can be related with other entities (ex: one customer may be related with many prescriptions).

The process model must be represented in BPMN, but the representation of the data fields required by each task or of the data model can be decided by you.

# 2 ORGANIZATIONAL CONSTRAINTS

You should be mindful that pharmacists are very sensitive to quality issues. In particular, pharmacists are unlikely to accept the possibility of giving to the technician any responsibility related to DUR checks, or to let a prescription be served to a customer without their quality check. Also, pharmacists are resilient to the idea of resolving DUR hard stops in front of the customer. Pharmacists would also resist any process change that would increase their workload substantially, especially during peak times, because they perceive that a higher workload would entail more pressure to work fast, and this pressure may lead to regrettable or even fatal mistakes.

Additionally, there are clear differences in salary costs between pharmacists ($50 an hour) and technicians ($25 an hour) and pharmacists are in high demand so that it is not easy to recruit a significant number of additional pharmacists. Hence, any proposed process change that entails hiring additional pharmacists is likely to be difficult to implement due to the additional cost and the lack of abundance of pharmacists.

# 3 E-PRESCRIPTIONS AND ONLINE SELF-SERVICE

Recently, an e-prescription system was introduced in some states where CVS operates. If a patient has been issued an e-prescription, CVS pharmacy staff can retrieve the details of the prescription from a state-wide e-prescription system. The data in an e-prescription are the same as in a paper-based prescription. We will assume that about 15% of prescriptions served by CVS pharmacies are issued as e-prescriptions.

You may also assume that an additional 40% of the pharmacy's customers would be willing to use a Web-based interface to interact with the pharmacy and that they have either scanners or high-resolution cameras to digitize documents if required. In addition, almost 100% of pharmacy users can be contacted via phone or SMS.

# 4 WHAT TO SUBMIT

You should submit a zip file with two components: (i) a **report file** in PDF and (ii) a **process model**. Please note that the name of the zip file should be exactly "EPTN gNN" where NN is your group number. The process model will not be analysed by the faculty, but the students must open and execute the simulation during project presentation.

The **report file** should contain the following sections:

1. A title page including the group number and the name of all team members and a table of contents with the page number for each section.
2. A section titled "Assumptions", where you present the assumptions you considered necessary.
3. A section titled "Opportunity Assessment" where you analyse the magnitude of the improvement opportunity based on the questions posed above.
4. A section titled "As-Is Process model", containing the "as-is" process model captured in BPMN. Make sure the model is readable. Make sure that the process model includes a high-level value chain.
5. A section titled "As-Is Process Analysis" including an issue register and any other qualitative or quantitative analysis of the as-is process.
6. A section titled "Process Redesign" including a description of the proposed process changes. For each change, you should explain why you suggest this change, which issue it would help to solve, how and to what extent. You are encouraged to quantify the potential impact of the proposed improvements. You are also encouraged to briefly discuss any process changes that you considered but you discarded either due to their feasibility or because their benefits were questionable.
7. A section titled "To-be Process model", presenting your process model in BPMN. Make sure the model is readable.
8. A section titled "Process Simulation" with the simulation results and specific assumptions used to run the simulation. The simulation results should sustain the expected benefits from the process redesign.
9. A section titled "Process Automation" with the corresponding information, such as the enriched process model, the data fields per task type, data model and other information required to understand the proposed process automation.

The **process model** must contain all the Bizagi project files (or of the tool you used), including the process model simulation. Make sure you are able to restore this file in your own machine and run the simulation at the project discussion with the faculty.

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