UNIVERSITY OF TARTU

MTAT.03.231 – Business Process Management

Regular Exam – 9 June 2015

Notes:

- *The exam is open-book, open-laptop, open-Internet. You can consult any course material during the exam and you can browse the Web.*
- *You are not allowed to share information with anyone during the exam, so e-mails and chats for example are prohibited.*
- *The exam should be submitted electronically using the Submit button in the course web site.*

Part 1. Disability Insurance Claims Handling at InsureIT

We consider the following business process for handling insurance claims for disability insurance[1] at an insurance company InsureIT.

The process starts when a customer lodges a disability claim. To do so, the customer fills in a form including a 2-page questionnaire describing the disability. The customer can submit the form physically at one of the branches of InsureIT, by postal mail, fax or simply via e-mail (digitally-signed document).

When a claim is received, a junior claims officer enters the claim details into the insurance information system. Data entry usually takes 10 minutes. The same junior claims officer performs a basic check to ensure that the customer's insurance policy is valid and that the type of claim is covered by the insurance policy. It is rare for the claim to be rejected at this stage (it only happens in 2% of cases). Next, the claim is moved to a senior claims officer who performs an in-depth assessment of the reported disability and estimates the monthly benefit entitlement, i.e. how much monthly compensation is the claimant entitled to, and for what period of time?

In the case of short-term disability benefits, the senior claims handler can perform the benefit assessment without requiring further documentation. In these cases, the benefit assessment takes 20 minutes on average. Once a decision is made, the senior claims handler registers the entitlement on the insurance information system and informs the customer of the outcome via e-mail or postal mail.

However, in the case of long-term disability claims (more than three months), the senior claims handler requires a full medical report in order to assess the benefit entitlements. Senior claims handlers perceive that these medical reports are essential in order to assess the claims accurately and to avoid fraud. Once the senior claims handler has received the medical report, they can assess the benefits in about one hour

[1] From Wikipedia: "Disability Insurance is a form of insurance that insures the beneficiary's earned income against the risk that a disability creates a barrier for a worker to complete the core functions of their work."

on average. The senior claims handler then sends a response letter to the customer (by e-mail and post) to notify the customer of their monthly entitlement and the conditions of this entitlement, e.g. when will the entitlement be stopped or when is it due for renewal? The entitlement is recorded in the insurance information system.

Later, a finance officer triggers the first entitlement payment manually and schedules the monthly entitlement for subsequent months. The finance officer takes on average 20 minutes to handle an entitlement. Finance officers handle payments in batches, once per working day.

When a medical report is required, a junior claims handler contacts the customer (by phone or e-mail) to notify them that their claim is being assessed, and to ask the customer to send a signed form authorizing InsureIT to request medical reports from their health provider (hospital or clinic). Health providers will not issue a medical report to an insurance company unless the customer has signed such an authorization. Customers are required to provide the authorization form at most 14 days after being requested to do so. If the authorization is not received within this delay, the claim is deemed to have been withdrawn. In general it takes about 4 days to get the authorization form from the customer.

Once the authorization has been received, the junior claims handler sends (by post) a request for medical reports to the health provider together with the insurer's letter of authorization. Hospitals reply to InsureIT either by post or in some cases via e-mail. On average, it takes 14 working days for InsureIT to obtain the medical reports from the health provider (including 4 working days required for the back-and-forth postal mail). This average however hides a lot of variance. Some health providers are very cooperative and respond within a couple of working days of receiving the request. Others however can take up to 30 working days to respond.

As a result, the average time between a claim being lodged and a decision being made is 3 working days in the case of short-term disability claims, and 22 working days for long-term disability claims.

Naturally, so long waiting times cause anxiety to customers. In the case of long-term disability claims, a customer would on average call or send an e-mail enquiry twice while the disability claim is being processed. These enquiries are answered by the junior claims handler and it takes him/her about 10 minutes per enquiry. In about a third of cases, junior claims handlers end up contacting the health provider to enquire about the estimated date to obtain a medical report. Each of these enquiries to health providers takes 10 minutes to a junior claims handler.

The total benefit paid by the insurance company for a short-term disability is EUR 5K (typically spread across 2 or 3 months). For long-term disability, this amount is 20K, but some claims can cost up to 40K to the insurance company. In case of long-term disability, the duration of the benefit (number of months) cannot be determined in advance when the claim is lodged. In these cases, the benefit is granted for a period of 3 months and a senior claims officer reviews the case every 3 months in order to determine if the benefit should be extended. Half of the benefit renewals are done after a simple check, which takes 30 minutes to the senior claims handler. But in the other half of renewals, the senior claims handler requires a new medical report, which means that the whole process of obtaining a medical report has to be repeated (except that the letter of authorization signed by the customer during the initial assessment

can be reused). It often happens that the renewal takes too long and customers stop receiving their monthly benefit temporarily during the renewal process.

The insurance company receives 2000 disability claims per year, out of which 20% are for short-term disability and 80% for long-term disability.

The company employs two full-time junior claims handler and two full-time senior claims handler dedicated to disability insurance.

InsureIT's sales department estimates that the extreme delays in handling disability claims costs EUR 50K per year to InsureIT in lost sales of insurance policies due to unsatisfied customers and the resulting negative publicity.

Given the persistent problems with obtaining health reports in a timely manner, claims handlers have tried to negotiate with several health providers a faster approach to obtain medical reports. A handful of health providers (the more cooperative ones) are willing to accept medical report requests by e-mail to save 2-3 working days. However, the majority of health providers do not see any incentive to put more resources into issuing medical reports for insurance companies. They perceive that their customers are the patients. The process of issuing medical reports to insurers is secondary for them.

Tasks

1a. ***[10 points].*** Model the above "as is" process in BPMN. Keep in mind that the purpose of this BPMN diagram is to serve as a means of communication between InsureIT's managers and claims handlers, and the business and IT analysts who have to re-design and automate this process.

1b. ***[5 points].*** Calculate the cycle time efficiency of the as-is process. Assume a working week of 40 hours. In case there is missing information, you can make assumptions about the missing information (e.g. assume a given processing time for a task). In this case, you have to explicitly state your assumptions.

1c. ***[10 points].*** Write an issue register with two major customer-perceived issues in this process. If you need to make assumptions to fill in the issue register, please write them down in an "Assumptions" column. If you find that there are more than two issues, focus on the two issues that have the highest impact.

1d. ***[10 points].*** Propose a set of between 2 to 4 changes in the process to address the two major issues identified above. For each change, you should indicate:

- Which issue(s) are being addressed by the proposed change?
- What will be introduced or dropped in the process? What will be done differently?
- Which performance measure(s) do you hypothesize will be improved thanks to the proposed change?
- To which BPR principle(s) or redesign heuristics is your proposed change related?

Part 2. Post-Mortem Analysis of an Insurance Claims Process

In this part, we consider another insurance claims handling process, this time a health insurance claims process at a travel agency (not connected with the one in part 1).

Upon registration of a claim, a general questionnaire is sent to the claimant. In addition, a registered claim is classified as high or low. A cheque and acceptance decision letter is prepared in cases where a claim is accepted while a rejection decision letter is created for rejected claims. In both cases, a notification is sent to the claimant. Three modes of notification are supported, i.e., by email, by telephone/fax and by postal mail.

The case is archived after notifying the claimant. The case is closed upon completion of archiving task.

The process has been executed in 2011 and in 2012 in the travel agency. The corresponding event logs are called "L1" for 2011 and "L2" for 2012. These logs are available on the course web page, below this exam.

The following tasks should be completed in ProM 5.2 using these two logs.

Tasks

2a. ***[2 points].*** Apply the log visualiser to describe the basic characteristics of each of the two logs.

2b. ***[2 points].*** In a similar way as above, describe the basic characteristics of the most frequent paths in each log.

2c. ***[2 points].*** For each log, indicate how many instances contain a high insurance check and how many instances contain a low insurance check. Briefly explain how did you obtain your answer.

2d. ***[3 points].*** Using 3 different discovery algorithms derive 3 Petri nets from L1. Using conformance checking, choose the best one (i.e. the Petri net that has the highest fitness with respect to L1). We call this Petri net p1.

2e. ***[3 points].*** Using 3 different discovery algorithms derive 3 Petri nets from L2. Using conformance checking analysis, choose the best one (i.e. the Petri net that has the highest fitness with respect to L2). We call this Petri net p2.

2f. ***[3 points].*** Design a BPMN model from p1 and a BPMN model from p2 and describe the differences between the two models