

## Assignment 1 – Activity-Based Costing

You have a small SW company with X employees with the following roles:

- CEO/founder – 2000 czk/hour
- Project manager – 1200 czk/hour
- Salesperson – 500 czk/hour + 1% from the value of a closed contract
- 2 team leaders – 1000 czk/hour
- 8 coders – 800 czk/hour
- 4 testers – 800 czk/hour

You want to know how much each phase of an SW project does cost you. The cost structure of your SW company is as follows:

- Office rent = 50k czk/month (including heating, electricity, etc.)
- Licence for IDE = 5k czk/month
- Licence for PM tools = 2k czk/month
- HW costs = 20k czk/year per coder; 10 czk/year per other employees

The average duration of tasks that your employees perform:

- Salesperson
  - Contract closing = 60 hours
  - Customer communication during the project = 4 hours per week
- Project manager
  - Project planning = 30 hours per project
  - Project management = 6 hours per project per week
  - General communication = 5 hours per week
  - Deployment of SW = 40 hours
- Team leader
  - 30 hours of design and analysis per project
  - 10 hours of leader responsibilities per week
  - Generates 100 LOC per hour
  - Deployment of SW = 40 hours
- Coder
  - Generates 80 LOC per hour
- Tester
  - Tests 120 LOC per hour

Your Salesperson secured a 3M project, that consists of 10k LOC, and your task is to say, how much each of the costs of the following phase:

- Sales phase
- Analysis and design
- Development
- Testing (every 50<sup>th</sup> LOC needs to be refactored after testing and tested again)
- Deployment

## Assignment 2 - simulation

This exercise is adapted from Dumas, M., Rosa, M.L., Mendling, J., Reijers, H., 2018. Fundamentals of Business Process Management, 2nd ed. Springer-Verlag, Berlin Heidelberg. pp. 283-285. The purpose is for you to experience how it is to focus on the business side of the process and try to make changes in it based on economic aspects.

Your goal will be:

1. to create two simulation scenarios (week as usual; week with disaster); print screens are below as is description;
  - a. You need to download the .bpmn file and import it into Signavio
  
2. to determine the average cycle time of the process for both variants for a week (week as usual; week with disaster);
  
3. to determine the average costs of the process for both variants for a week (week as usual; week with disaster);
  
4. to identify what could be done with the process when following changes in KPIs:
  - a. Decrease the percentage of closed (paid) claims per week by 10%.
  - b. Decrease the average cost of the process per week by 10%.
  - c. Decrease the average cycle time of the process per week by 10%.
  - d. Increase customer satisfaction with call center per week by 5%.
  - e. Increase customer retention with the insurance company by 5%.

**Exercise 7.10** The insurance company called Cetera is facing the following problem: Whenever there is a major event (e.g., a storm), their claim-to-resolution process is unable to cope with the ensuing spike in demand. During normal times, the insurance company receives about 9,000 calls per week, but during a storm scenario the number of calls per week doubles.

The claim-to-resolution process model of Cetera is presented in Figure 7.15. The process starts when a call related to lodging a claim is received. The call is routed

to one of two call centers depending on the location of the caller. Each call center receives approximately the same amount of calls (50–50) and has the same number of operators (40 per call center). The process for handling calls is identical across both call centers. When a call is received at a call center, the call is picked up by a call center operator. The call center operator starts by asking a standard set of questions to the customer to determine if the customer has the minimum information required to lodge a claim (e.g., insurance policy number). If the customer has enough information, the operator then goes through a questionnaire with the customer, enters all relevant details, checks the completeness of the claim, and registers the claim.

Once a claim has been registered, it is routed to the claims handling office, where all remaining steps are performed. There is one single claims handling office, so regardless of the call center agent where the claim is registered, the claim is routed to the same office. In this office, the claim goes through a two-stage evaluation process. First of all, the liability of the customer is determined. Secondly, the claim is assessed in order to determine if the insurance company has to cover this liability and to what extent. If the claim is accepted, payment is initiated and the customer is advised of the amount to be paid. The tasks of the claims handling department are performed by *claims handlers*. There are 150 claims handlers in total.

The mean cycle time of each task (in seconds) is indicated in Figure 7.15. For every task, the cycle time follows an exponential distribution. The hourly cost of a call center agent is € 30, while the hourly cost of a claims handler is € 50.

Describe the input that should be given to a simulator in order to simulate this process in the normal scenario and in the storm scenario. Using a simulation tool, encode the normal and the storm scenarios, and run a simulation in order to compare these two scenarios.



Costs



Duration



Frequency



Resources

	Task	Execution costs
1.	Check if customer has all required information	0,00 €
2.	Register claim	0,00 €
3.	Check if customer has all required information	0,00 €
4.	Register claim	0,00 €
5.	Determine likelihood of the claim	0,00 €
6.	Assess claim	0,00 €
7.	Initiate payment	0,00 €
8.	Advise claimant of reimbursement	0,00 €
9.	Close claim	0,00 €



Costs



Duration



Frequency



Resources

	Task	Execution time (Format: hh:...
1.	Check if customer has all required information	00:01:00 ...
2.	Register claim	00:09:00 ...
3.	Check if customer has all required information	00:01:00 ...
4.	Register claim	00:09:00 ...
5.	Determine likelihood of the claim	00:02:00 ...
6.	Assess claim	00:20:00 ...
7.	Initiate payment	00:02:00 ...
8.	Advise claimant of reimbursement	00:04:00 ...
9.	Close claim	00:01:00 ...



Costs



Duration



Frequency



Resources

	Role	Work schedules	Costs / hour
1.	Call center 1	4 resources, 160:00:00 hours per week	... 30,00 €
2.	Call center 2	4 resources, 160:00:00 hours per week	... 30,00 €
3.	Claims handling office	15 resources, 600:00:00 hours per week	... 50,00 €



Costs



Duration



Frequency



Resources



Resources

Execution probability

	Gateway	Probability
	Decision: Has customer all the information?	
1.	NO	10%
2.	YES	90%
	Decision:	
1.		80%
2.	claim is rejected	20%
	Decision: Has customer all the information?	
1.	NO	10%
2.	Register claim	90%
	Decision:	
1.	Assess claim	85%
2.	insured could not be liable	15%
	Decision: Team selection	
1.	Team 1	50%
2.	Team 2	50%

As usual

Disaster



Costs



Start frequency

	Start event	Frequency
1.	Phone call received	On Mon - Fri; overall 900 times ...

As usual

Disaster



Costs



Start frequency

	Start event	Frequency
1.	Phone call received	On Mon - Fri; overall 1800 times ...

