WP4: Tutorial about the cost of an investment: The example of a radiography equipment

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Materials and method:

This tutorial is meant to help the students understand the idea of fixed and variable costs through an investment choice.

The main goals of the training for the students are:

- To be able to explain the difference between expenses and costs ;
- To get the ideas of variable and fixed costs and their consequences ;
- To be able to define and calculate a break event point ;
- *A minor goal would be to define and calculate amortization and repayment of loan.*

The main goals of the tutorial for the lecturer are:

- ***To let students discover the main questions by themselves. (That the reason why the cost elements are given step by step.)***
- *It is possible to drive the tutorial step by step. The student may work into small groups and gather at the end of one step to get the explanations of the lecturer.*

Questions:

This tutorial is an introduction to the main questions vets will have to deal with concerning the cost calculation in their activities. The case study deals with an investment, that is to say the decision to spend money today to purchase equipment or production facilities to be used over time. The cost elements will be added step by step to reach the correct way to calculate costs.

Suppose you are a vet responsible for a vet surgery and you would like to buy a numerical radiology equipment:

- The cost of a new equipment is 56 K€.
- There is no need to maintain it, but you should contract an insurance against damage or breakage which costs 300 €/year.
- Each radiology uses consumables (0.50 €/radiology).
- The expected number of radiologies you will have to perform is 150 radiologies a year.
- The expected longevity of the equipment is 7 years.

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In the whole tutorial, suppose you don't aim at any profit on this peculiar activity, that is to say you are on your break-even point (easier to work on costs).

First step : fixed and variable costs, amortization

Q1: What is the marginal cost of a radiology, once the investment cost is paid? What part is fixed? What part is variable ?

Q2: Suppose you buy the radiology equipment. What are your annual expenses?

Q3: How much would the client the first year pay to cover these expenses? The other years? Do you find it fair? What solutions can you imagine?

Second step : Cost of a the availability of money (loan)

Q4: Suppose now you have to obtain a loan to buy your radiology equipment:

- The loan duration is 4 years and you ray each year one fourth of the amount of money lent to you.
- You have to pay to the bank each year 10% interest on the amount of money still available to you at the beginning of the year.

What are your annual expenses?

Q5: What are your annual costs? Are they variable or fixed?

Q6: How much would the client the first year pay to cover these costs? The other years? Do you find it fair? What solutions can you imagine?

Third step : overhead costs (example of work time)

Q7: Now suppose you would like to calculate a complete cost. You don't allocate any cost concerning the building, but you take work time in consideration. You employ a nurse whose wage is about 3 200 €/month (160 h work), social contributions included. What would now be the total costs for a numerical radiology, which takes 10 minutes pro radiology to perform?

Q8: What are the consequences on other costs in the surgery if you choose to allocate work time in your cost calculation? Do you consider it really worthwhile to take the work time in consideration?

Fourth step: economies of scale

Q9: Would your conclusion be the same if you were to perform 200 radiologies a year? 300 ? 400 ?

Q10: What if the clients were ready to pay only 43 € a radiology?

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