

University of Leicester
Department of Informatics
CO7218/CO4218/CO7518 - Financial Services
Information Systems/Business Information Systems
2020/2021

Assignment 1

Due on Thursday 4th March 2021, 4pm

I. Objective

- The assignment is inspired by a real-life case. In particular, you are introduced to a kind of a non-technical problem solving task that IT professionals often have to deal with in practice. The assignment develops the students' skills in problem solving, analysis and reporting.

II. Important Dates:

1. Starting date	Wednesday 17 th February 2021
2. Submitting date	Thursday 04th March 2021, 4pm

III. Policy on Plagiarism:

- **The Department operates the principle that both the plagiarised and the plagiariser are equally guilty.** Students are therefore responsible for ensuring that their work is not plagiarised, and note that this includes ensuring that any work stored on the departmental and/or university computer systems is suitably protected.
- Note that the Department reserves the right to exact any penalties which are in accordance with the University's code of practice on plagiarism.
- The Department has its own set of regulations concerning plagiarism which can be found in the Study Guide of any module. The Department takes this issue very seriously, and students should note that on occasions in the past some very serious penalties have indeed been applied, including reduction of module mark to zero, and overall reduction of degree class.
- **Additionally: Plagiarizing any part of the assignment will result in getting ZERO in the whole assignment.**

IV. Assignment #1

Imagine that the bank you work for is about to buy a software product for the implementation of a new application. After researching the market, it has been concluded that there are 3 alternatives: a commercial package (Product A), a cloud based SaaS product (Product B) and a commercially supported open source software (Product C). Your manager has asked you to perform a comparative study of the 5-year costs of the 3 products, based on the variation of number of users that will have access to the application and prepare a power-point presentation that summarizes your findings and conclusions.

After contacting the products' vendors, talking to your colleagues at the bank and researching the market you have identified the following facts:

Product A

Product A consists of 6 components (sub-products) that are all required for the new application, however, they are licensed independently:

- Sub-product A1 that is licensed on a per user basis, costing £100 per end-user that will have access to the application.
- Sub-product A2 that is licensed on a per user basis, costing £150 per end-user that will have access to the application.
- Sub-product A3 that is also licensed on a per user basis, costing £300 per end-user will have access to the application.
- Sub-product A4 that is licensed based on the number of CPUs that are installed on the application server that the product will “run”, with a cost of £5000 per installed CPU.
- Sub-product A5 that is licensed based on the number of CPUs that are installed on the application server that the product will “run”, with a cost of £4000 per installed CPU.
- Sub-product A6 that is licensed based on the number of CPUs that are installed on the application server that the product will “run”, with a cost of £3000 per installed CPU.

It is estimated that in order to be able to perform adequately in the production environment, Product A requires 2 CPUs for up to 300 Users, 4 CPUs for 301 to 600 Users and 8 CPUs for 601 to 1000 Users.

Additionally, the new application will have a disaster recovery site for which the license cost for product A is calculated as 30% of the license fee of the production site assuming that the production site license fee is calculated with 0 (zero) Users.

Note that, given its purpose, the disaster site still needs to have the appropriate processing power in order to be able to accommodate the same number of users as the production environment.

Additionally, starting from the second year, for Product A, the bank will have to pay the product vendor an annual 18% maintenance fee over the final product license fee (where the final product license fee includes both the production and the disaster recovery sites license).

The implementation/customizations fee that the vendor will apply for Product A is fixed and equal to £200 000. Moreover, starting from the second year, the vendor will apply an annual 15% maintenance fee over the implementation/customizations fee.

Product B

The cloud based SaaS product (Product B) uses a hybrid license and subscription based pricing. The license for Product B is based on the number of different users that will have access to the product. The facts for Product B are as follows:

- The initial license fee for end-users (i.e. business users) is £350 per end-user.
- The subscription based fee, is due on an annual basis, starts from the first year, with a cost of £300 per end-user.

There is no disaster recovery site costs for Product B, given that this is a cloud-based solution.

There are no implementation/customizations fees involved for Product B.

Product C

The commercially supported open source product (Product C) license is subscription-based (i.e. maintenance only), starts from the first year and costs £25 000 per year, per CPU installed on the application server that the product will run.

It is also estimated that in order to be able to perform adequately in the production environment, Product B requires 2 CPUs for up to 400 Users, 6 CPUs for 401 to 600 Users and 8 CPUs for 601 to 1000 Users. The licensing cost of the disaster site for Product C is zero.

The implementation/customizations fee that the vendor will apply for Product C is fixed and equal to £500 000. Moreover, there is no annual maintenance fee involved for Product C.

H/W

Each CPU (H/W) of the production and disaster environments is acquired at a cost of £5,000 and has an annual maintenance fee of 10% over the acquisition cost. The CPU's (H/W) maintenance fee starts from the second year.

Questions

Based on the facts above, in order to prepare the presentation to your manager, you should perform the following tasks:

- Devise the mathematical formulas that calculate the 5-year costs for each of the 3 products above (the 5-year costs should include all costs involved).
- Based on the previous formulas and using MS Excel or by developing your own application (in which case you are free to use any programming language/technology of your choice), implement the formulas you devised and also build a diagram to show (in the same diagram) the 5-year TCO costs of each of the products as a variation of the number of end-users, in other words the

vertical axis is the 5-year cost (in £) , whereas the horizontal axis is the number of end-users ranging from 100 to 1000, in intervals of 50 end-users.

- Prepare a concise power point presentation to your manager (in a presentation form suitable for your manager). The slides of the presentation should include at least the following:
 - the facts you have identified (already described above),
 - the graph you have prepared (as defined above)
 - complete the following table and include it in the presentation, assuming 300 end-users.

	Total CAPEX	Total OPEX	Total TCO
Product A			
Product B			
Product C			

- your own conclusions from this analysis you performed i.e. what does your analysis show that your manager needs to be aware of? e.g., which of the 3 products is more cost-effective and in which cases? If you wish, you may include other calculations in order to reach conclusions on the comparison (e.g. the 7-year or the 10-year costs of each product)
- A list and brief explanations of **five additional cost factors** that you believe the previous analysis does not take into account, but should nevertheless be considered in order to be able to calculate with more precision the final total 5 year-cost of the application. For example, the cost of telecom lines for the production and disaster environments of is one such factor.

Notes:

1. If you use MS Excel to implement your formulas you will probably need to use the Excel “IF” function for which you can find several resources online (depending on which MS Excel version you will use). You would also need to create charts in Excel, a task for which you can also find several resources online.
2. If you prefer not to use MS Excel, you may choose any programming language and user interface or technology (e.g. browser-based or other) to implement the application (as long as it runs in a Windows XP or later OS and does not need any special software or even hardware)
3. The assignment will be marked according to the following criteria:

Criteria	Weight
Formulas Completeness and Correctness and Graphs Implementation Quality, Completeness and Correctness (either in MS Excel or other)	65%
Quality of the Power Point report contents and presentation elements	35%

V. Submission Notes:

Submissions should be made electronically containing the following deliverables:

- The .xls file with the formulas implementation or the source code you have developed in which case the “byte” code and the necessary scripts and a file with instructions on how to set up and “run” it in a Windows XP or later OS should also be included.
- The report (in .pdf format) that you would have delivered to your manager.
- All the above should be bundled in a .zip file that should be named Assignment1.zip