**Managing IT Resources – ITWS 4310**

**Mid Term Exam – October 15, 2018**

* Place your full name on the top of the document in the header.
* Enter your answers directly into this document. Attach any supporting files or links (as required) and note that you have done so in the corresponding answer in this document.
* All answers should be in be in your own words and be sure to check spelling and use proper grammar.
* Make sure your answers use an alternative font and color.
* Save the document as ‘YourLastName\_yourFirstName-F18\_MITR\_Midterm.docx (or doc).
* Place all applicable and related documents including this one in a folder named F18\_MITR\_Midterm-YourFirstName\_YourLastName\_YourRCSID
* When finished with the exam, zip your folder containing all applicable and related files into a zipped folder named F18\_MITR\_Midterm-YourFirstName\_YourLastName\_YourRCSID.zip
* Submit the .zip folder to LMS prior to 11:50:00 AM (hard deadline).
* Late submissions will receive a maximum score of 75%.
* Make sure your submitted document remains in MS Word format – Pages, GDocs, etc… will not be graded!
* You must follow all of these instructions or you will lose points. Remember, attention to detail!

1. **Financial and Market Analysis** (20 points total)

|  |  |  |  |
| --- | --- | --- | --- |
| $B | Company  A | Company  B | Company  C |
| Revenue | 300 | 300 | 300 |
| Cost of Goods Sold | 120 | 240 | 180 |
| Gross Profit | 180 | 60 | 120 |
| Sales & Marketing | 80 | 20 | 24 |
| Research & Development | 25 | 10 | 12 |
| Operating Profit | 75 | 30 | 84 |
| Taxes, Interest, Other | 15 | 9 | 18 |
| Net Profit | 60 | 21 | 66 |

Answer the following questions using the simplified hypothetical income statements above. **Label your answers with the correct units**. **You must show your work for any calculations required for full credit!**

* 1. What is the Gross Profit Margin of Company C? (3 points)
     1. ($300B-$180B)/$300B = 0.4 or 40%
  2. What are the total Fixed Costs of Company B? (3 points)
     1. $20B + $10B = $30B
  3. What is the Net Profit Margin of Company A? (3 points)
  4. What are the total Variable Costs of Company C? (3 points)
     1. $18B (from Taxes, Interest, Other => “Load”)
  5. What is the Operating Profit Margin of Company B? (3 points)
  6. Assume that companies A, B and C each represent a company with these financials (over recent years) in varying industries. **Which one of these 3 companies** is **most likely** Apple? **Which one of these 3 companies** is **most likely** Google? Explain your reasoning. (5 points)
     1. Company A is likely Apple, since a large portion of Apple’s expenses are in Sales, Marketing, and R&D. The company that is most likely Google is Company C, since their fixed costs are lower.

1. **The “Netflix” Case** (20 points total)
   1. **Describe** the “**Long Tail**” concept? Answer using complete sentence(s). (3 points)
      1. The *Long Tail* represents the demand for available products. It assumes that there is demand for every product in a company’s inventory. The most popular products have high demand, the head of the demand curve, but there are many more products that have much smaller quantity demanded, but are still represented on the demand curve. Most often, stores don’t carry products in the tail since demand isn’t high enough for them to carry it.
   2. **Describe** how the “**Long Tail**” concept **relates** to 1) “**economies of scale**” and 2) **e-Commerce** (doing business via the internet)? Answer using complete sentence(s). (5 points)
      1. Netflix really knew how to use its large size to the best of its ability. They had multiple distribution centers nation wide,
   3. **Describe “Collaborative Filtering”**? Answer using complete sentence(s). (3 points)
      1. *Collaborative Filtering* is where a system monitors trends in consumer preferences and utilizes this data to cater to individual consumer needs and make recommendations.
   4. **Describe** how “**collaborative filtering”** provided a “**competitive advantage”** to **Netflix**? Answer using complete sentence(s). (5 points)
      1. Netflix’s use of *Collaborative Filtering* came in the form of Cinematch, a proprietary algorithm used to recommend movies to clients. Recommended titles made up more than 60% of the content that Netflix users placed in their DVD request queues. Additionally, Cinematch recommended films based on what users rated the films they previously watched. This provided a *competitive advantage* over Blockbuster because if a user were to abandon Netflix for Blockbuster, they would be abandoning their personalized user feed. This in turn pressured people to remain dedicated to Netflix
   5. **Briefly describe** one key **“Market Pressure”** faced by **Netflix**, an Internet Services media distribution company. Answer using complete sentence(s). (4 points)
      1. One of the key market pressures Netflix faces is the pressure from studios when it comes to licensing the distribution of shows and movies. Studios are moving towards abandoning Netflix in favor of streaming their products via their own service. This is pressuring Netflix to move towards its own content production.
2. **Key Concepts of this MITR Course** (20 points total)
3. Correctly list the Six Components of a Computer-Based Information System. (3 points)
   1. The Six Components of a CBIS are: Hardware, Software, Data, Network, Processes, and People.
4. True/False: Every computer-based information system will have all six components. (2 points)
   1. True - they might not have things like hardware in house, but it still uses the hardware infrastructure through things like the Cloud and SaaS.
5. Which of the six components is the most important? (2 points)
   1. People are the most important because its people interact with the CBIS.
6. Uber and Airbnb are larger than any taxi firm or hotel chain on the planet. In what important way does the infrastructure used by these firms to deliver services differ from more traditional rivals? (4 points)
   1. Uber and Airbnb do not own any of their key resources. For Uber, this means it does not own the fleet of taxis but rather has people sign up to be a taxi-for-hire. For Airbnb, they do not own any property but rather rely on individuals to voluntarily share their properties and turn them into temporary “hotels”.
7. Should a firm’s source or sources of competitive advantage impact its decisions to make, buy, or rent software? Yes or no? Explain why. (4 points)
   1. Yes it absolutely should impact business decisions. Firms should analyze their sources of competitive advantage and determine whether making, buying, or renting software would continue to maintain that competitive advantage.
8. What are the primary sources of value for network effects? List and define. Then, give a brief description of how these factors work to provide value for network effects. (5 points)
   1. Exchange: Exchange creates value, and every product or service subject to network effects fosters some kind of exchange
   2. Staying power: The long-term viability of a product or service. Networks with greater numbers of users suggest a stronger staying power
   3. Complementary benefits: Products or services that add additional value to the network
9. **Term Project and Project Planning**: Answer the following questions based on your **Team’s** **Term Project**, the Gallaugher text and class discussions: (15 points total)

* 1. What is the **name** of your “**client organization”?** (1 point)
     1. *Troy Cloth & Paper* is our client organization.
  2. What is the **“Problem” and the “IT Solution” to the problem faced by your client.** Answer briefly using complete sentence(s). (4 points)
     1. [From the Project Proposal] Troy Cloth & Paper has recognized their method for providing customer quotes has become unmanageable and inefficient. They use over 40 parameters that contribute towards quoting a customer, and their current method of manual estimates is severely hindering efficiency. Our team is going to automate the ordering process by gathering all customer parameters and querying them against the existing pricing algorithm. This will, in turn, allow the business to give customers and staff an accurate pricing in real time. The product will act as a central system to manage pricing and quotas. It will remove human error and guesswork, resulting in more efficient business operations and more price transparency for the customers.
  3. **Discuss the implications of the “Triple Constraint”** associated with your team’s term project. Answer in complete sentences. (5 points)
     1. The *Triple Constraint* impacts the term project because we are limited in all three areas: time, scope, and cost. We do not have a long time to produce the solution for Troy Cloth & Paper. As a result, we have to keep the scope of the project at a minimum, and we cannot use any resource that would be too costly for us to maintain.
  4. **Describe one significant potential risk** for your team’s Term Project and how your team can mitigate that risk. Answer using complete sentence(s). (5 points)
     1. One of the larger risks associated with our project is the Level of Customization, which falls under Technology risks. This project has a lot of specific requirements, and we need to make sure we are maintaining scope at all times, otherwise we will be off target and miss potential deadlines.

1. **IT Economics and CBA** (25 points total)

A commercial drone maintenance company, **Hover Cover,** has hired you as an **IT Consultant** to perform a **Cost Benefit Analysis** (CBA) and to **recommend** whether to “**Build**” or “**Lease**” an "**Inventory Management System**” (**IMS**) using the following information.

Inventory Management System **“Build” Scenario** facts and assumptions:

* + A license for the IMS software (including OS, DB, & training) will be purchased from Better Inventory Systems at an initial cost of $40,000 with 20% annual maintenance payable during years 1, 2, and 3. ✓ (cost)
  + The IMS system will eventually reduce the cost of materials, which will improve both operating and net income during years 2 and 3. The Hover CoverCFO (Chief Financial Officer) estimates that the net income increase due to materials will be $0 (zero) in year 1, +$20,000 in year 2 and +$30,000 in year 3. ✓ (benefit)
  + The cost of capital (interest rate that must be achieved for economic viability) is 12%, comprised of the 7% commercial loan interest rate that Hover Coveris charged by its bank, plus a 5% interest premium that the bank requires to cover increased risk due to “building” the system. ✓ (interest rate for NPV)
  + The system requires two (2) Dell servers that cost $6,000 each in year 0. At the end of 3 years, the system will be retired, and the two servers will be sold for $2,500 total salvage value. ✓ (cost)
  + The IMS will save supply chain analysts’ time. Hover Coverexpects employee costs savings of $40,000 in year 1, and for these savings to be 25% higher in year 2 and another 10% higher in year 3. ✓ (benefit)
  + In order to populate the system, the IMS will require 200 hours of data entry time before production cutover at $40/hour for salary and benefits, and 50 hours each in Years 1, 2, and 3.   
    ✓ (cost)

1. **Create a new MS Excel spreadsheet** named “YourFirstName\_YourLastName-Midterm\_CBA” and **clearly label a Table** of **"Costs", "Benefits", and "Net Annual Benefits"** for years 0 through 3 and populate the Table with the data from the list above for the **Build Scenario**. **Submit this MS Excel file on LMS** as part of your midterm submission zip folder. (10 points)
   1. See CBA excel sheet “BUILD SCENARIO” for details
2. **Using Excel functions, calculate** the **Net Present Value** (NPV) for the “Build” scenario, then enter below with **appropriate precision**, and **labeled** with correct units. (3 points)
   1. NPV with interest rate of 12% = $40,435
3. **Using Excel functions, calculate** the **Internal Rate of Return** (IRR) for the “Build” scenario, then enter below with appropriate precision, and **label**ed correctly. (2 points)
   1. IRR = 54%

The benefits (material savings, employee savings) for the **“Lease” Scenario** are the same as for the “Build” Scenario, but the costs are different due to the “complete stack” Software as a Service (SaaS) solution.

The “**Total Costs**” for the **“Lease” Scenario** are summarized as follows:

Year 0 = $20,000

Year 1 = $42,000

Year 2 = $45,000

Year 3 = $48,000

1. Using the same “YourFirstName\_YourLastName-Midterm\_CBA” excel spreadsheet as before, **construct a table of "Total Costs", "Total Benefits", and "Net Annual Benefits"** for years 0 through 3 and populate the Table for the **Lease Scenario**. Remember – you must submit this excel file on LMS as part of your midterm submission. (3 points)
   1. See CBA excel sheet “LEASE SCENARIO” for details
2. **Using Excel functions, calculate** the **Net Present Value** (NPV) for the **“Lease” Scenario** using the **7% commercial bank loan interest rate** available to Hover Cover. Enter the NPV below with **appropriate precision**, and **labeled** with correct units. (2 points)
   1. NPV with 7% interest rate = -$11,017 (in the red)
3. **If** it was the only option, **does your CBA financially justify the “Lease Scenario”**? **Explain the rationale** for this answer**.** Answer using complete sentence(s). (3 points)
   1. It does not justify the lease scenario - we would be in debt by a little over $11,000
4. Considering both options**, which Scenario** (“**Build**” or “**Lease**”) should you **recommend** to the client? **Explain the rationale** for your recommendation**.** Answer using complete sentence(s). (2 points)
   1. I would recommend building the system as opposed to leasing, since building the system means we have fixed costs for maintenance and data entry, whereas leasing costs way more overhead.