**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% | 60 – 20% | 120 – 40% |
| Sales & Marketing | 80 | 20 | 24 |
| Research & Development | 25 | 10 | 12 |
| Operating Profit | 75 - 25% | 30 – 10% | 84 - 28% |
| Taxes, Interest, Other | 15 | 9 | 18 |
| Net Profit | 60 - 20% | 21 – 7% | 66 - 22% |

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)

120/300 = 40%

* 1. What are the total Fixed Costs of Company B? (3 points)

20 + 10 = $30 B

* 1. What is the Net Profit Margin of Company A? (3 points)

60/300 = 20%

* 1. What are the total Variable Costs of Company C? (3 points)

$180 B

* 1. What is the Operating Profit Margin of Company B? (3 points)

30/300 = 10%

* 1. 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)

Company C = Apple, Company A = Google

Answers should look at gross profit margin.

Apple is a hardware company but they control their supply chain so well that they can do better than the hardware industry average of 20% and get 40%.

Google is mostly considered an internet software company and these software companies traditionally have gross profit margins of around 60% due to lower variable costs for each unit of software sold.

1. **The “Netflix” Case** (20 points total)
   1. **Describe** the “**Long Tail**” concept? Answer using complete sentence(s). (3 points)

Long Tail is a phenomenon whereby firms can make money by offering an extensive or vast selection of low-demand individual items.

* 1. **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)

Long Tail thrives on economies of scale because if the seller is large, then the seller can afford to have a huge selection of low-demand items, which drives traffic and demand, which in turn allows even a broader selection of items, reinforcing the phenomenon. Long Tail works especially well in e-Commerce situations because geographic or proximity contraints largely disappear, allowing large selections of items from centralized locations instead of having to stock huge inventories for local purchase.

* 1. **Describe “Collaborative Filtering”**? Answer using complete sentence(s). (3 points)

Collaborative Filtering is a type of software that monitors trends among customers, recognizes similar customer habits, and uses this data to personalize an individual customer’s experience.

* 1. **Describe** how “**collaborative filtering”** provided a “**competitive advantage”** to **Netflix**? Answer using complete sentence(s). (5 points)

Collaborative Filtering provided Netflix with a competitive advantage because of the huge amount of customer data that Netflix has amassed as the dominant competitor in internet movie distribution, first by DVD and later by streaming. Netflix gained a large customer base as a first-mover and captured their buying preferences and behaviors with their innovative collaborative filtering and recommendation capabilities. This huge amount of data then represented a switching cost for customers.

* 1. **Briefly describe** one key **“Market Pressure”** faced by **Netflix**, an Internet Services media distribution company. Answer using complete sentence(s). (4 points)

Possibilities here include ISP pressure on net neutrality laws, competitive pressure from other media distribution competitors, changing consumer tastes, more restrictive content licensing arrangements, etc.

1. **Key Concepts of this MITR Course** (20 points total)
2. Correctly list the Six Components of a Computer-Based Information System. (3 points)

6 components: Hardware, Software, Data/Database, Network, People, Processes/Procedures

1. True/False: Every computer-based information system will have all six components. (2 points)

False

1. Which of the six components is the most important? (2 points)

People

1. 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)

Uber, the world’s largest “taxi service,” owns no vehicles for hire. Airbnb, the world’s largest accommodations provider, doesn’t own a single hotel or rental property. (Don’t accept ‘mobile’ or ‘uses smartphones’ as answers since traditional rivals also heavily leverage technology, including smartphone apps.)

1. 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)

Yes: Firms should ask - *Do we rely on unique processes, procedures, or technologies that create vital, differentiating competitive advantage?* If so, then these functions aren’t good candidates to outsource or replace with a package software offering. Amazon had originally used recommendation software provided by a third party, and Netflix and Dell both considered third-party software to manage inventory fulfillment. But in all three cases, these firms felt that mastery of these functions was too critical to competitive advantage, so each firm developed proprietary systems unique to the circumstances of each firm.

1. 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)

The value derived from network effects comes from three sources: exchange, staying power, and complementary benefits.

Exchange: Every product or service subject to network effects fosters some kind of exchange. Just about any standard that allows things to plug into one another, interconnect, or otherwise communicate will live or die based on its ability to snare network effects.

Staying power: Staying power refers to the long-term viability of a product or service. Networks with greater numbers of users suggest a stronger staying power.

Complementary benefits: Complementary benefits are those products or services that add additional value to the network. These products might include “how-to” books, software add-ons, even labor.

These three value-adding sources—exchange, staying power, and complementary benefits—often work together to reinforce one another in a way that makes the network effect even stronger. When users exchanging information attract more users, they can also attract firms offering complementary products. When developers of complementary products invest time writing software—and users install, learn, and customize these products—switching costs are created that enhance the staying power of a given network. From a strategist’s perspective this can be great news for dominant firms in markets where network effects exist. The larger a firm’s network, the more difficult it becomes for rivals to challenge its leadership position.

1. **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)

Specific to individual projects.

* 1. What is the **“Problem” and the “IT Solution” to the problem faced by your client.** Answer briefly using complete sentence(s). (4 points)

Specific to individual projects.

Most common error is to describe solution, not the essence of the problem.

* 1. **Discuss the implications of the “Triple Constraint”** associated with your team’s term project. Answer in complete sentences. (5 points)

Should discuss that the schedule is fixed and there is no budget so the scope must be managed accordingly in order to be able to deliver a successful project.

* 1. **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)

Specific to individual projects.

Risk mitigation can be risk avoidance strategy and/or contingency plan(s).

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.
  + 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.
  + 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 the increased risk due to “building” the system.
  + 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.
  + 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.
  + 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.

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)
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)

\_\_\_\_$70,000\_\_\_

1. **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)

\_\_\_61%, also accept 60% or 62%\_\_\_\_

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)
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)

\_\_\_\_\_\_$30,000\_\_\_\_

1. **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)

Yes. Rationale is that the NPV is positive and the IRR is greater than the cost of capital.

1. 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)

Build. Rationale is that the Build NPV is far greater than the Lease NPV, and the IRR is somewhat better also.