**Managing IT Resources – ITWS 4310**

**Final Exam – December 19, 2018**

-Name this file with: yourLastName\_yourFirstName\_F18\_MITR\_FinalExam.doc or .docx

-Enter your name at the top of all pages.

-Type your answers into this Word file. You must respond in your own words – copying and pasting is prohibited and will result in loss of points.

-Use a different font/color for your responses.

-Upload this Word file (submission must be in .doc or .docx format) into LMS at the end of the exam.

1. **Term Project Issues and Lessons Learned:** Answer the following questions based on your Team’s Term Project: (15 points total)

* 1. What is the **name** of your “client organization”? (2 points)
  2. **Technical Lessons Learned: Briefly describe** **one** significant **technical** issue or challenge your team encountered during your project. **How** did your team address this issue? Was the team’s response **successful** or **unsuccessful**? Answer using complete sentence(s). (3 points)
  3. **Teamwork Lessons Learned: Briefly describe** **one** significant **teamwork** issue or challenge your team encountered during your project. **How** did your team address this issue? Was the team’s response **successful** or **unsuccessful**? Answer using complete sentence(s). (3 points)
  4. **Client Lessons Learned: Briefly describe** **one** significant **client/user** issue or challenge your team encountered during your project. **How** did your team address this issue? Was the team’s response **successful** or **unsuccessful**? Answer using complete sentence(s). (3 points)
  5. **Describe** the **“Integration”** that occurred between the **“Cost-Benefit Analysis”,** the **“Project Plan”** and the **“System Requirements”** within your Term Project. Answer using complete sentences. (Hint: Consider the three primary constraints in project management.) (4 points)

1. **Strategy and Business Cases.** (11 points total)
   1. Amazon launched its cloud computing offerings ahead of rivals Google and Microsoft. What are the advantages of moving early in markets for cloud computing? (2 points)
   2. Was Amazon able to capitalize on its early advantage and does this advantage still hold true today? What fact/data supports your answer? (1 point)
   3. Compare advertising via Google versus Facebook. What is one factor related to user actions that makes Google more attractive to advertisers than Facebook? What is one factor related to user information that makes Facebook more attractive to advertisers than Google? (4 points)
   4. Why do smart phones present an increasing challenge to Google? (4 points)
2. **“Technology Trends” and the “RPI Infrastructure Tour” (**12 points total)
   1. Electrical power, network connectivity, cooling, and space are the four primary physical considerations for siting a data center.  **Which one** of these has the **greatest cost impact** when selecting a global site location for **very large** data centers **nowadays**?  **Which one** of the four had the greatest cost impact **20 years ago**?  **Explain** **why** **this change has occurred** in the context of **two** **technology growth laws** that were discussed throughout the course.  Answer using complete sentence(s).  (4 points)
   2. **List** the **six “Components of Information Systems”** that we have been discussing all semester. **Identify one specific example** from the tour or from the tour class notes of **each of the six** “Components of Information Systems” in the Rensselaer IT infrastructure. (6 points)
   3. **Identify four (4) different mechanisms** used to **protect or provide security** for the data in a data center like the Voorhees Computing Center (VCC). (2 points)

1. **Data, Information, Knowledge** (9 points total)

* 1. **Name and describe** **three** (3) types of **“Enterprise Systems Applications”** including their **primary** functionality. Answer using complete sentence(s). (3 points)
  2. What is **data mining?** Identify **(3) key areas** where businesses are **leveraging data mining** and be sure to **define each area.** Answer using a complete sentence(s). (4 points)
  3. **Briefly discuss one key point** made in the book, **The Signal and the Noise by Nate Silver.** Answer using complete sentence(s). (2 points)

1. **Information Security and Risk Management** (9 points total)

In the role of consultant to the CISO (Chief Information Security Officer) for a medium-sized company, you have to recommend the investments for information security measures for this fiscal year. The proposed purchases from which you have to choose are as follows:

|  |  |  |
| --- | --- | --- |
|  | **Information Security Measure** | **Cost** |
| A | Two-Factor or Biometric Passwords | $ 150K |
| B | Offsite Business Continuity Servers | $ 100K |
| C | End-User Education Program | $ 50K |
| D | Proactive Event Monitoring & Logging | $ 150K |
| E | Redundant Internet Connection | $ 200K |
| F | Network Firewall Upgrade | $ 200K |

* 1. The table below is the risk summary for six information security events that an external security auditor was contracted to assess. **Calculate the (Probability \* Impact) cost for each threat and enter it in the table**. (½ point each, 3 points total)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat Events** | **Annual**  **Impact** | **Annual**  **Probability** | **Annual**  **P\*I Cost** | **Mitigation**  **Measure** |
| Phishing attack to establish Botnets | $ 80K | 50% |  |  |
| DDoS (Denial of Service) Attack | $ 1,000K | 25% |  |  |
| Password Cracking Attack | $ 10K | 80% |  |  |
| Severed Internet Connection | $ 2,000K | 5% |  |  |
| Primary Server Room Flood | $ 9,000K | 1% |  |  |
| Internal Rogue System Administrator | $ 500K | 1% |  |  |

* 1. **Match each threat event** in the table with the **most appropriate** Information Security Measure from the first table. **You may use each Information Security Measure only once**. Enter the letter identifying the matching measure in the Mitigation Measure column. (½ point each, 3 points total)
  2. You are constrained to a **budget of $500K** that you can spend this year on Information Security Measures. Based on your cost-benefit analysis from the data presented in the two tables, **identify which Information Security Measure(s) you would purchase this year**. (2 points)
  3. Thinking probabilistically, at 0% interest rate (cost of money), **what is the payback period (break-even) for the information security investment that you recommended**? (1 point)

1. Less than 1 year
2. Between 1 and less than 2 years
3. Between 2 and less than 3 years
4. Between 3 and less than 4 years
5. Greater than or equal to 5 years

1. **Term Projects, Portfolio Mgmt.** You listened to and evaluated all of the Term Projects in the class. You will now assume the role of a manager assessing these projects. (12 points total)
   1. The Applications Portfolio Strategy matrix was presented as a methodology to assess which IS/IT projects to pursue. **List the simple actions that should be recommended for projects that fall in each cell of the matrix**. (2 points)

High

**D**

**B**

High

Low

Low

**FIT**

**VIABILITY**

**C**

**A**

|  |  |  |  |
| --- | --- | --- | --- |
| **Action for Cell A:** |  | **Action for Cell B:** |  |
| **Action for Cell C:** |  | **Action for Cell D:** |  |

* 1. **Identify four (4) other projects** in the class (**excluding** the one on which you worked), such that one each would be placed into each one of the four cells in the “Application Portfolio Matrix”. (2 points)

|  |  |
| --- | --- |
| **Cell** | **Project / Client Name** |
| A |  |
| B |  |
| C |  |
| D |  |

* 1. **Discuss why** you assessed **both** the **fit** andthe **viability** of **each** of the four projects asyou did to justify your matrix placement of these projects. Answer using complete sentence(s). (8 points)

|  |  |  |
| --- | --- | --- |
| **Project/Client Name** | **Why the “Viability” Assessment** | **Why the “Fit” Assessment** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

1. **Financial Analysis** (6 points total)

|  |  |  |  |
| --- | --- | --- | --- |
| $B | Company  A | Company  B | Company  C |
| Revenue |  | 400 | 200 |
| Cost of Goods Sold | 150 |  | 122 |
| Gross Profit |  |  |  |
| Sales & Marketing | 35 |  | 24 |
| Research & Development |  | 50 | 12 |
| Operating Profit | 50 |  |  |
| Taxes, Interest, Other |  | 15 | 18 |
| Net Profit | 40 | 75 | 24 |

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

* 1. If the Gross Profit Margin of Company B is 60%, what is the Cost of Goods Sold for Company B? (2 points)
  2. What are the total Fixed Costs of Company C? (2 points)
  3. If the Operating Profit Margin of Company A is 20%, what is the Revenue of Company A? (2 points)

1. **Financial Metrics of IT Companies studied in Business Cases.** (6 points total)

Four technology industries we studied this semester (**Computer HW, Internet Services, Software, and Communications/Networking**) are each represented, although not in that order, in the Table of Financial Data below by Industry A, B, C, and D.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Financial Metric** | **Industry A** | **Industry B** | **Industry C** | **Industry D** |
| Gross Profit Margin  (5 Year) | 70% | 30% | 25% | 62% |
| Operating Profit Margin (5 Year) | 22% | -10% | 10% | 22% |
| Net Profit Margin  (5 Year) | 18% | -12% | 5% | 16% |

Note: all numbers in table are typical and approximate (+/- 2%)

1. Which of the **four industries listed** is representative of the **‘Industry C’ column**? **Describe the rationale** why your choice matches the financial metrics. Answer using complete sentences. (2 points)
2. **Industry A and Industry D** have very similar financial metrics. **Which two out of the four industries listed** would best represent these two columns? What do these **industries have in common** that results in such **high gross profit margins**? Answer using complete sentence(s). (4 points)
3. **Ethical Issues in Current Events.** (10 points total)
   1. Select and **state a significant “Ethical Issue associated with Information Technology”.** **Describe how** this “Ethical Issue” **is complex** and has no simple right (ethical) or wrong (unethical) answer for some real-world event (current event article read for this class and its specific citation). **Describe the pros and cons** for making a choice in this specific situation. **State which one choice you would make** in this specific situation (e.g. is Edward Snowden a “Black Hat Hacker” or a “White Hat Hacker” and you cannot use this example). Answer in about ½ page of complete sentences. (5 points)
   2. **Should Google build a “China-specific censored search engine”**? Give a specific “yes” or “no” answer to the question. **Provide arguments in favor and in opposition** to your answer. **You must use information and knowledge gained from specific current event articles** read for this course (and cite them appropriately) for at least part of your response. Answer in about ½ page of complete sentences. (5 points)

1. **Data Management and Data Warehouses** (10 points total)



1. **Define** **each** of the **three (3) data sources** in the above Data Life Cycle Process diagram **and** **list one typical example** of data **from each** of these sources. (3 points)
2. **Which** **one** of the three data sources in the above diagram would typically have the **greatest** **data quality** and **ease of incorporating** into a data warehouse? **Describe two (2) reasons** to support your answer.Answer using complete sentence(s). (3 points)
3. **What** is “**Meta Data**” and **why** is it important? Answer using complete sentence(s). (2 points)
4. **Describe two (2) distinct advantages** or **benefits** of using “**Data Marts**” as subsets of a “Data Warehouse”. Answer using complete sentence(s). (2 points)