

# 70-451 MANAGEMENT INFORMATION SYSTEMS (SPRING 2012)

Tepper School of Business, Midterm exam, Dr. Wolfgang Gatterbauer, March 7, 2012

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## Rules:

- Don't turn the page unless advised to do so
- You have 50min; budget time carefully
- Don't forget to put down your name and Andrew ID above
- Closed books, closed notes, no laptops or other mobile devices
- Please write clearly
- An extra page is provided in case you run out of space (make sure to put a forward reference)
- Relax! You are here to learn

Sections	Max	Grade
1. True or False section: Q1-Q12 (1 point each)	12	
2. Multiple-Choice section: Q13-Q27 (2 points each)	30	
3. Free-text section: Q28-Q39 (varying)	18	
4. Data Management section: Q40-Q43 (varying)	20	
Total	80	

## 1. Binary-Choice section (Circle True or False)

- (1) Elaborate customer surveys help Zara designers predict fashion trends months into the future and design products accordingly.

*True False*

- (2) Limited production runs ensure customers do not have to visit Zara's stores as often as they visit other stores.

*True False*

- (3) Zara's IT expenditure, measured by IT workers as a percentage of total employees, is only slightly higher than the industry average.

*True False*

- (4) An information system consists of hardware, software, data, procedures, and the people who interact with and are impacted by the system.

*True False*

- (5) In a two-sided market, a cross-side exchange is when an increase in the number of users on one side of the market (console owners, for example) creates a rise in the other side (software developers). Software developers write games based on their ability to reach the greatest number of paying customers, so they are most likely to write for the most popular consoles first. Increase in video game consoles means increase in software developers.

*True False*

- (6) Two reasons why Netflix's attempt to spin off its DVD rental service as Qwikster backfired so catastrophically were continued perceived value of customers to have the option of renting DVD by mail services, and the underestimated price sensitivity of customers.

*True False*

- (7) According to Michael Porter, the reason so many firms suffer aggressive, margin-eroding competition is because they have defined themselves according to strategic positioning rather than operational effectiveness.

*True False*

- (8) Dominant firms with low switching costs can be rapidly overtaken by strong rivals.  
*True False*
- (9) Network externalities exist when a product or service becomes less expensive as more people use it.  
*True False*
- (10) The sophisticated collaborative filtering algorithms and software developed by Netflix is a source of competitive advantage to the firm.  
*True False*
- (11) Organizations that leverage SaaS are exempt from having to adopt newer versions of software  
*True False*
- (12) The advent of cloud computing and SaaS has resulted in reduced dependency on venture capital for startups.  
*True False*

## 2. Multiple-Choice section (circle the correct answer)

- (13) Collaborative filtering is a classification of software that:
- a. is used to gather user ratings and calculate a gross average user rating for each movie.*
  - b. provides Netflix users parental controls and other options while streaming movies online.*
  - c. selectively sorts movies based on their censor ratings and delivers age-appropriate search results.*
  - d. monitors trends among customers to personalize an individual customer's experience.*
  - e. collates user ratings for a movie and creates a ranked list of movies most liked by users.*
- (14) The cost of producing an additional unit of a product is known as:
- a. isocost.*
  - b. transaction cost.*
  - c. marginal cost.*
  - d. redundancy cost.*
  - e. implicit cost.*

- (15) Look at the following rating matrix. Which item would any reasonable collaborative filtering algorithm recommend to user 1 ( $u_1$ )? Circle the item's number below the rating matrix.

	$i_1$	$i_2$	$i_3$	$i_4$	$i_5$	$i_6$	$i_7$
$u_1$	5	5	4	-	-	-	-
$u_2$	-	5	5	4	1	-	-
$u_3$	4	5	-	5	-	-	-
$u_4$	5	-	4	4	-	1	1
$u_5$	1	-	-	-	4	4	5
$u_6$	-	-	1	-	5	4	-
$u_7$	-	1	-	2	5	-	5

Table: Rating Matrix

1      2      3      4      5      6      7

- (16) What solution has Netflix come up with to address the need to deliver content to customers' televisions?

- Netflix has entered into a revenue sharing agreement with Apple to produce customized set top boxes.*
- Netflix has acquired shares in the largest network provider in the USA.*
- Netflix has invested in a hardware division to build and market its own set top boxes.*
- Netflix has acquired Vudu, a firm that specializes in the online streaming business.*
- Netflix provides a software platform to firms seeking to build Netflix access into their devices.*

- (17) \_\_\_\_\_ involves outsourcing production to third-party firms.

- Vertical integration*
- Long tailing*
- Peer production*
- Contract manufacturing*
- Viral production*

- (18) How does Zara differ from its competitors in converting ideas into products?

- Zara's ideas are inspired by the latest catwalk fashion shows, compared to the intrinsic design processes followed by its competitors.*
- Zara's design and concept teams use data from customers to predict fashion trends many months into the future and stock up inventory accordingly, as opposed to its rivals.*
- Zara concepts appear in stores in fifteen days on average compared to rivals who receive new styles once or twice a season.*
- Collaborations with celebrities helps Zara churn out a limited, yet profitable, volume of items every year, while rivals produce a higher volume of less fashionable items.*
- By employing star designers, Zara manages to conceive a wider range of fashion trends than its rivals.*

- (19) As the world's largest chain of coffee houses, Starbucks sources most of its raw materials like coffee beans and vegetables from suppliers owned by it. It also holds equal or majority stakes in most of the foreign direct investment it carries out in other countries to set up franchisee coffee shops. Based on this information, Starbucks can be said to be:
- privately owned.*
  - vertically integrated.*
  - operationally effective.*
  - publicly traded.*
  - logistically stacked.*
- (20) Zara negates the risk of maintaining high inventory by:
- outsourcing production to contract manufacturers in Turkey and Asia.*
  - using technology-driven goods distribution systems for stores around the world.*
  - recruiting young designers fresh out of school to design its clothes, rather than employing star designers.*
  - keeping large swaths of production processes in-house.*
  - having limited production runs of its wares.*
- (21) According to an independent study, Zara books some 85 percent of its products at full price compared to the industry average markdown ratio of 50 percent. This is made possible by:
- keeping a major part of the production processes under direct proprietary control*
  - coordinating the outbound shipments of all Inditex brands with return legs loaded with return materials and half-finished items.*
  - using feedback rather than hunches and guesswork to plan and issue rebuy orders.*
  - the practice of having limited production runs of its designs.*
  - leveraging contract manufacturers to produce only staple items with longer shelf-lives, which account for one-eighth of dollar volume.*
- (22) Which of the following is not one of Porter's Five Forces of Industry and Competitive Analysis.
- Rivalry among competitors*
  - Threat of new entry*
  - Buyer Power*
  - Network effects*
  - a&d*
- (23) Operational effectiveness is usually not enough to yield sustainable competitive advantage because:
- it is not profitable for firms to perform the same tasks differently from their rivals.*
  - technology can be easily duplicated.*
  - firms adopting such an approach have high switching costs.*
  - firms attempt to match the benefits of a successful position while maintaining their existing position.*
  - it is unprofitable to perform tasks that are different from those of rivals*

- (24) Moving first pays off when the time lead is used to create:
- distribution channels for an efficient supply chain.*
  - operational effectiveness to harness maximum profitability.*
  - critical resources for competitive advantage.*
  - high stock value to generate funds for expansion.*
  - market entry to ensure sustainable competitive advantage.*
- (25) In the following SQL query, what does the '\*' do?  
SELECT \* FROM employees
- Sorts rows in ascending order*
  - Selects all rows*
  - Selects all columns*
  - Selects only those rows that have '\*' in them*
- (26) One of the risks associated with SaaS is:
- the dependence on a single vendor.*
  - the inability to migrate to new versions of software*
  - the reduced reliance on a network connection.*
  - the costs associated with storing large amounts of data in-house.*
  - the user interface of Web-based software being more sophisticated than desktop alternatives.*
- (27) Utility computing includes:
- Software as a service (SaaS)*
  - Platform as a service (Paas)*
  - Infrastructure as a service (IaaS)*
  - b&c*
  - All of the above.*

### 3. Free-text section (use the white space below the question)

(28) One Gigabyte (1 GB) has how many bytes? [1 point]

(29) One Terabyte (1 TB) has how many bytes? [1 point]

- (30) After Kilo, Mega, Giga, and Tera, what is the next prefix? [1 point]
- (31) One "next prefix" (see before) of bytes has how many Terabytes (1 \_\_ = \_\_ TB)? [1 point]
- (32) This SQL clause allows a condition on grouped attributes, and can thus be called "the WHERE clause for the GROUP BY clause" [1 point]
- (33) In order to ensure a guaranteed up time and define the vendor's ability to meet demand spikes a cloud computing customer may sign a \_\_\_\_\_ with the vendor. (You can write the answer below). [1 point]
- (34) List 2 companies and their product ("Company A with product B") that are models in the way they have gained competitive advantage by finding / exploiting new unusual distribution channels [2 points]:
- (35) What are the two types of competitive advantage? Define each. [2 points]?

(36) List 4 factors other than "distribution channels" that can give a business competitive advantage. [2 points]

(37) Name 4 factors that can help a firm establish a network effects lead. [2 points]

(38) In the case "Developing an App for that" we discussed how timing can be critical when launching a new application, especially with regard to attracting new customers. Which of the following months for target launch seems like a really bad idea. Shortly explain why (be concise) [2 points]

*a. September*

*b. November*

*c. July*

(39) List 4 lessons learned from Webvan's failure and contrast with FreshDirect(remember to be concise in your answers) [2 points]



## 4. Data Management section

- (40) Your best friend who just started her job as data analyst for the immigration office comes to you for help. She has database with schema **Immigrant(id,fName,lName,phone,visaType, expDate)**. Dates are represented as strings in the format 'mm/dd/yyyy'. She wants to find all the immigrants with F1 visa whose visa is expiring in May 2012 and is very unhappy because her SQL query below does not give her the expected results. Make the minimal change (changing one single character) to her query below to help her get the results she wants. [4 points]

```
SELECT fName, lName
FROM Immigrant
WHERE visaType LIKE 'F1'
      AND expDate LIKE '%5%012'
```

- (41) You were recommended to the Dean as SQL expert. He has never learned SQL and needs your help. He sits in front of the student database with schema **Student(name, age, country)**, which contains tens of thousands of students from around the world. He wants to find out how many students below age 16 are from each country. What SQL query should he use? [6 points]

- (42) You have done so well in this class that you become TA next year. The lecturer decides to re-use assignment 1. Below is problem 2 from assignment 1 and the solution from one student. What is wrong? [4 points]

HotSprings Spas manufactures and sells two spa models: the Steamboat and the Classic. HotSprings Spas receives spa bodies from another manufacturer and then adds a pump and tubing to circulate the water. The Steamboat model demands 15 hours of labor and 14 feet of tubing. The Classic model requires 10 hours of labor and uses 21 feet of tubing. Based on selling patterns, the owner, Deborah Liebson, has determined that the Steamboat model generates a profit of \$400 per unit, and the Classic model generates \$345 profit. While Deborah would like a large labor capacity and sufficient tubing and motors to build any number of spas, her resources are limited. For the next production period, Deborah has 2,650 labor hours, 3,550 feet of tubing, and 215 pumps available. Deborah needs assistance in figuring out how many Steamboat and Classic models to build in order to maximize her profit. Given the constraints above, use Solver to assist Deborah in her what-if analysis.

	Steamboat	Classic	
Labor	15	10	
Tubing	14	21	
Profit	400	345	
# of Units	115.1428571	92.28571429	
Total Profit	46057.14286	31838.57143	77895.71429
	Constraints	Actual	
Labor	2650	2650	
Tubing	3550	3550	
Pumps	215	207.4285714	

(43) Draw the Entity-Relationship Diagram that corresponds to the following schema (which is a subset of the IMDB movie database you have used in SQLite). Remember that you will need to draw the type of relationship between entities. Choose the ones that are implied by the schema. [6 points]

**Actor**(id, first\_name, last\_name, gender)

**Roles**(actor\_id, movie\_id, role)

**Movie**(id, name, year, rank)

**Actor**.id and **Movie**.id are the primary keys of the corresponding tables

**Roles**.actor\_id is a foreign key to **Actor**.id

**Roles**.movie\_id is a foreign keys to **Movie**.id

## 5. EXTRA PAGE