Processes Systems and Information 3rd edition McKinney Solutions Manual

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Chapter 1

The Importance of MIS

Chapter Objectives/Study Questions

- **Q1. Why is Introduction to MIS the most important class in the business school?**
- **Q2. What is MIS?**
- **Q3. How does MIS relate to organizational strategy?**
- **Q4. What five forces determine industry structure?**
- **Q5. What is competitive strategy?**
- **Q6. How does competitive strategy determine value chain structure?**
- **Q7. How does competitive strategy determine business processes and information systems?**

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List of Key Terms

- **Abstract reasoning** – the ability analyze information and think creatively to develop and manipulate a model or representation a problem, object or an idea.
- **Barrier to entry** - factors that make it difficult for a new business to begin operating in an industry.
- **Categorical imperative** – the principle that one should behave only in a way that one would want the behavior to be a universal law; i.e. we should act in a way that we would like other people to follow.
- **Competitive strategy** – the strategy by which an organization tries to attract customers, makes profits, and differentiates itself from its industry competitors.
- **Experimentation** – the ability to develop new business alternatives or ideas and test those alternatives, consistent with available resources.
- **Five forces model** – a model developed by Michael Porter that is used to assess an industry structure. The model identifies five competitive forces that determine profitability: threat of substitutes, threat of new entrants, existing rivals, bargaining power of suppliers, and bargaining power of customers.
- **Information age** – the current time where the production, distribution, and control of information are the primary driver of the economy.
- **Linkages** – interactions across value chain activities.
- **Management (of MIS)** – the creation, monitoring, and adapting of processes, information systems, and information.
- **Margin** - the difference between the value that an activity generates and the cost of the activity.
- **Moore's Law** - The number of transistors per square inch on an integrated chip doubles every 18 months.
- **Primary Activities** – the five activities in the value chain that contribute directly to improving the completive advantage of a business. These activities are: inbound logistics, operations/manufacturing, outbound logistics, sales and marketing, and customer service.
- **Substitute** – a product or a service that performs the same or similar function as another product or service in the market and can be used as alternative to that product.
- **Support Activities** – the four value chain activities that support the five primary activities. Support activities consist of: Procurement, Technology, Human Resources, and Firm Infrastructure.
- **Systems thinking** – the ability to divide a problem or phenomenon into smaller components and understand the relationships, associations, and interactions among those components to help explain the problem or phenomenon.
- **Value** – refers to how much money people are willing to pay for a product or a service; helps business charge fair and acceptable prices for their products or services.
- **Value chain** – a network of processes or activities by which businesses add value to their products.

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MIS InClass 1

In this chapter, we have asked you to think about work skills that are in demand in business today. For example, one might be good collaboration, another the ability to use software effectively. If you can do these skills well, you will have a better chance at finding and keeping a great job

Step 1: In collaboration with teammates, write down six skills that you think are most in demand in business today. Each team member writes down the same list.
While the skills that students will write will vary and a large number of skills can be listed by the teams, major skills should include: abstract thinking, experimentation, collaboration, systems thinking, innovation, team-work, and technology-savvy.

Step 2: In discussion with teammates, identify and circle four of these skills that your team believes are most often lacking in students.
Answers will vary from one team to another. Probably most students will circles the skills discussed in the chapter such as abstract thinking, collaboration, systems think, and experimentation.

Step 3: Evaluate yourself: On which of these four are you capable, and on which of these are you less capable/weakest?
Answers will vary among students. For example, some students will indicate that they are strong in collaboration and technology-use. Some students will indicate that they are week in abstract reasoning and systems thinking

Step 4: In discussion with teammates, decide which of these four are taught well by other classes at your school and which are not.
Schools offer different courses, but most schools offer some of the following courses:
Introduction to Information Systems courses, like this course, to teach students about current technologies used in business and give students exposure to various technologies such as ERP/SAP.
Strategy courses teach students about strategic planning and developing competitive strategies.
Supply Chain Management courses teach students about inbound and outbound logistics, inventory, and production.

Step 5: Based on what you know about this class, which of the four skills can you practice in this class? How will you know that you are better at them?

- Systems Thinking - Students can learn systems thinking when they understand that an information system is composed of components/subsystems that work together to improve business operations and achieve organizational goals.
- Collaboration - Students can learn collaboration when they work in teams and communicate with each other using various technologies (emails, chats, document-sharing etc.) to complete their teamwork.

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- Abstract Reasoning - Students can learn abstract thinking from Chapter 5, which discusses processes redesigns and improvements to develop As-Is and Ought-to-Be diagrams.
- Ability to Experiment - (may not be directly taught in this course because students are not given resources to experiment with different models or solutions).

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Using Your Knowledge

1-1. One of life's greatest gifts is to be employed doing work that you love. Reflect for a moment on a job that you would find so exciting that you could hardly wait to get to sleep on Sunday night so you could wake up and go to work on Monday.

a. Describe that job. Name the industry, the type of company or organization for whom you'd like to work, the products and services it produces, and your specific job duties.

b. Explain what it is about that job that you find so compelling.

c. In what ways will the skills of abstract reasoning, systems thinking, collaboration, and experimentation facilitate your success in that job?

d. Given your answers to parts a–c, define three to five personal goals for this class. None of these goals should include anything about your GPA. Be as specific as possible. Assume that you are going to evaluate yourself on these goals at the end of the quarter or semester. The more specific you make these goals, the easier it will be to perform the evaluation. Use Figure 1-5 for guidance.

Responses to parts a through d will depend on the major, interests and goals of each student. Answers should address all parts of the question and be well supported.

Responses will probably focus on the student's major and will address the four cognitive skills discussed in the chapter (abstract reasoning; systems thinking; collaboration ; and ability to experiment).

1-2. Suppose you decide to start a business that recruits students for summer jobs. You will match available students with available jobs. You need to learn what positions are available and what students are available for filling those positions. In starting your business, you know you will be competing with local newspapers, Craigslist (*www.craigslist.org*), and your college. You will probably have other local competitors as well.

a. Analyze the structure of this industry according to Porter's five forces model.

Type	Competitive Force	Threat	Strength Assessment
Competitive	Substitutes	Local newspapers (may be expensive but ubiquitous, also probably online) Craigslist.org (zero switching costs—for most cities) College placement office (zero switching costs, possibly limited listings)	Local newspapers threat: strong Craigslist.org threat: medium College placement office threat: medium Online job placement sites: weak

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		Online job placement sites (zero switching costs, not convenient for most employers)	
	New Entrants	Barriers to entry: Credibility with employers, access to students, focus on the local area	Threat of new entrants: weak
	Rivalry	Customers influenced by price/marketing/ position volume, popularity with employers and job applicants	Rivals threat: strong
Supply Chain Bargaining Power	**Supplier**	Employers (low switching costs) Internet Service Provider (Web site – many competitors including free services)	Employers bargaining power: strong, due to many substitutes ISP bargaining power: weak
	Customer	Students	Student bargaining power: medium

b. Given your analysis in part a, recommend a competitive strategy.

Example:

The appropriate strategy for this business might be a blend of cost-leadership and quality. In terms of cost, offering this service to potential employers and job applicants (students) should not be too expensive since it does not require a substantial capital to start and run this business. Different pricing plans can be offered based on the provided services and added features.

In terms of quality, this service can include many features that increase value of job and applicant postings such as interactive access where students and employers can update their postings, résumé tips, priority placement, interview training, and job specific interview information and questions, etc.

c. Describe the primary value chain activities as they apply to this business.

- Inbound logistics – make the business known to students and employers; provide an easy way to sign up for the service; create an app for easy and fast access from smart phone and mobile devices.
- Operations/manufacturing – enhanced search capabilities, better matching of students based on their résumés and interests to employer opportunities; and make it easy for students and employers to access and update their information.
- Outbound logistics – notification of student/employer matches to both the students and employers – email, text messaging and Twitter would work, along with the telephone of course. Additionally, the delivery of premium services to students mentioned in the business model is part of outbound logistics.

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- Sales and Marketing (to students) – Advertise to students in local media; social media; university newspaper and bulletin boards. Distribute brochures to students at job fairs, student organizational meetings, and other university events. Other tools include YouTube, Facebook, LinkedIn, campus bulletin boards, a Web site, email lists, contacts in student organizations, viral marketing, as well as the student newspaper, campus radio and television, and potentially a working relationship with the University/College Placement Center.
- Sales and Marketing (to employers) - Advertise to employers in local media; social media; and business directory. Distribute brochures to employers at job fairs and other university events. Other tools include YouTube, Facebook, LinkedIn, campus bulletin boards, a Web site, email lists.
- Customer service – respond to students' and employers' questions or suggestions; follow up with students and employers once matches have been communicated to each. Follow up regarding the satisfaction of each party once a student is hired and has worked for a while.

d. Describe a business process for recruiting students.

Students need to know about this business/service before they use it. Thus, it is important that this business is publicized to students in traditional and social media.

Traditional media- local media (radio, television, and newspapers), bulletin boards; university newspaper; and a working relationship with the University/College Placement Center.

Social media- such as YouTube, Facebook, LinkedIn, Twitter, Web site, and email lists are also crucial to attract and recruit students to post their information with this business.

e. Describe information systems that could be used to support the business process in part d.

The information system required for this business would include several components:

- An App to provide access on mobile devices such as smart phones and other tablets.
- A Web site with information about the business for both students and employers. It would include interactive forms by which students and employers could enter their information into the database.
- An email system that is used in the sales and marketing, inbound logistics, outbound logistics, and customer service value chains.
- A system to interface and interact with social media platforms such Facebook, LinkedIn, Twitter, email, etc. would not be necessary, but may be cost effective as the business grows.
- A payment and accounting system to collect charges and maintain financial records.

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f. Explain how the process you described in part d and the system you described in part e reflect your competitive strategy.

The competitive strategy for this business centers on cost-leadership (for students and employers) and quality of offered services.

For cost-leadership, the business must search for and contact most Webhosting to negotiate better deals to allow the business to offer its services at lower prices. The business also can decrease its payroll by hiring students as part-time employees or interns to develop and maintain the needed applications.

The business can also keep enhancing its services by introducing new features and capabilities to their Web sites and applications. For example, students should be able to update their information using a Web site or a mobile app.

1-3. Consider the two different bike rental companies in Figure 1-12. Think about the bikes they rent. Clearly, the student bikes will be just about anything that can be ridden out of the shop. The bikes for the business executives, however, must be new, shiny, clean, and in tip-top shape.

a. Compare and contrast the operations value chains of these two businesses as they pertain to the management of bicycles.

The two operations value chains are very similar, yet the differences can be traced back to the differing competitive models and different target markets.

The student-bike business model focuses on low-cost operations that utilize minimal information, average material, and no automation to track sales and collections, plus no customer relationship management and probably limited product selection.

The executive-bike business model focuses on high-quality operations that utilize high-quality materials, more designs and selections, and use customer-tracking and past sales information (CRM to some extent) to enhance the customer experience and to aid in product inventory, selection, and collection.

b. Describe a business process for maintaining bicycles for both businesses.

Low-cost: Clerk does a visual check of the bike upon return and puts it back in inventory if it is in a working condition and does not have any obvious damages.

High-cost: Scan the bike's inventory tag upon return, probably have a bicycle mechanic to perform a comprehensive check on it, and clean it before putting it back in inventory.

c. Describe a business process for acquiring bicycles for both businesses.

1. Determine which bicycles currently in inventory must be replaced and make a list.
2. Identify potential vendors of bikes.
3. Send the list of needed bikes to several vendors for bids.
4. Collect bids and determine which vendor will supply new bicycles.
5. Purchase new bicycles.
6. Take delivery of new bicycles and put them to service.

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d. Describe a business process for disposing of bicycles for both businesses.

1. Examine bicycles culled from inventory to identify those that are resalable and those that are not.
2. Sell non-resalable bicycles for scrap after removing any working parts.
3. Sell resalable bicycles via Craigslist, eBay, the newspaper, or some other outlet, or trade-in on new bicycles.

e. What roles do you see for information systems in your answers to the earlier questions? The information systems can be those you develop within your company or they can be those developed by others, such as Craigslist.

1. Low-cost: Low-tech information system to control inventory, rentals, returns and collections.
2. High-cost: An integrated CRM and point-of-sale system that itself is integrated with the resort's billing system.
3. Both: Craigslist, eBay, or a similar system to sell culled inventory.
4. Twitter or text messaging could be effectively used by either business to notify potential customers of rental availability and to notify customers when bicycles are soon due to be returned.
5. Social media and mobile apps to advertise special deals or discounts.

1-4. Using Monster.com or the Bureau of Labor Statistics (www.bls.gov/bls/occupation.htm), read about a job you are interested in pursuing after graduation. Specify:

a. What skills are required?

Students will pick different jobs based on their interests and majors. Probbaly most of the jobs they selected will be Business-related careers such as finance, accounting, marking, MIS etc.

The skills will be dependent on the selcted job but almost all jobs will require the four non-routin cogbnitive skills discussed in this chapter:

- Abstract reasoning
- Systems thinking
- Collaboration
- Ability to experimen

b. What education level is required?

Most likely all selected jobs will require a college degree in business-related major.

c. What is the entry-level pay range?

Pay range dependes on the selected job, location of the job, and required years of experience.

d. **Go to LinkedIn and create an account if you do not already have one. Using search, find professionals who are working at the job you specified. Write**

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down their career path, that is, the jobs they did prior to their current job. Scroll down on their LinkedIn page and record their experience and featured skills.

Responses will vary widely among students.

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Collaboration Exercise 1

Collaborate with a group of fellow students to answer the following questions. For this exercise do not meet face to face. Your task will be easier if you coordinate your work with SharePoint, Office 365, Google Docs with Google+, or equivalent collaboration tools. (See Chapter 9 for a discussion of collaboration tools and processes.) Your answers should reflect the thinking of the entire group, not just that of one or two individuals.

1. **Abstract reasoning.**
   a. **Define *abstract reasoning,* and explain why it is an important skill for business professionals.**
   Abstract reasoning is the ability to formulate and manipulate models. It is a vital skill for business professionals because the formulation and manipulation of models is a primary means by which new ideas are vetted and initial experiments can be conducted without having to expend physical resources.

   b. **Explain how a list of items in inventory and their quantity on hand is an abstraction of a physical inventory.**
   The list of inventory items and the quantity on hand of each item in inventory is an abstraction of a physical inventory (or an abstract model of inventory) because it is not the physical inventory itself, yet it accurately represents inventory in a model that, given knowledge of what inventory items match the item descriptions (the descriptions themselves representing an abstraction), a person reading the inventory list and QOH figures will have an accurate understanding of what the physical inventory actually is.

   c. **Give three other examples of abstractions commonly used in business.**
   - An accounting system is an abstraction of the actual financial status of the business.
   - A customer list is an abstraction of a business' actual customers.
   - A technical drawing of a product is an abstraction of the actual product that is manufactured.

   d. **Explain how Jennifer failed to demonstrate effective abstract reasoning skills.**
   She was unable to create a mental abstract model of the Flextime that may have allowed her to better understand how the business works and to generate and experiment with alternative models that might improve the business.

   e. **Can people increase their abstract reasoning skills? If so, how? If not, why not?**
   Abstract reasoning is highly correlated with intelligence, education, and past experiences. Abstract reasoning can be improved with practice, reading, and education. Word puzzles and number puzzles such as Sudoku are often cited as examples of exercises that improve intelligence and abstract reasoning.

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Www.increasebrainpower.com lists more than a dozen ways to increase intelligence, from certain supplementation to exercise to writing. (Writing is a form of abstraction as well.)

2. **Systems thinking.**
   a. **Define *systems thinking,* and explain why it is an important skill for business professionals.**
   Systems thinking, simply defined, is the understanding that every component in a system has an effect on other components in a system and that every system has effects on other systems. Systems thinking is important for business professionals because business processes are part of a business system. If you change an activity in a process, or a component in a system, it is vital to understand how the change will affect other components, activities, and the system as a whole.

   b. **Explain how you would use systems thinking to explain why Moore's Law caused a farmer to dig up a field of pulpwood trees. Name each of the elements in the system, and explain their relationships to each other.**
   Moore's Law states that the number of transistors that can be placed in a square inch on an integrated chip will double every 18 months. This exponential doubling of computing power every 18 months has held true, more or less. The result is a computing industry that has also grown exponentially. Integrated circuits lead to the development of microcomputers. By as early as 1990, almost every office worker's desk sported a microcomputer and every microcomputer was connected to a printer.

   Millions of microcomputers connected to printers means that much more paper is used for printing documents. More printing paper means an increased demand for pulpwood to make paper, which would mean an increase in the price of pulpwood. The increased price of pulpwood would mean that the margin associated with clearing a field of pulpwood increased to the point where the farmer could justify clearing the field for agricultural use.

   At a very high level, the elements in the system include the microcomputer industry, the business community as a whole, the paper industry, and a farmer with a field of pulpwood trees.

   c. **Give three other examples of the use of system thinking with regard to consequences of Moore's Law.**
      1. The manifestation of Moore's Law made fighting fires and searching for survivors at ground zero safer after the World Trade Center towers fell on 09/11/2001.
      2. The manifestation of Moore's Law resulted in an exponential increase in the number of network administrators.
      3. The manifestation of Moore's Law helped gold traders make billions of dollars.

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d. Explain how Jennifer failed to demonstrate effective systems-thinking skills.
Jennifer failed to demonstrate effective systems thinking a couple of times. First, when she failed to consider the business activity that occurred after her workday, she didn't realize the night manager is an important part of the system. Second, she was unable to produce a diagram of the client life cycle.

e. Can people improve their system-thinking skills? If so, how? If not, why not?
Systems thinking requires the creation of a mental model of systems – i.e., abstract reasoning. If abstract reasoning can be improved, systems thinking can be improved. By learning more about systems, as well as value chains and business processes and their interrelatedness, systems thinking can be improved. Basically, with practice, systems thinking can be improved.

3. Collaboration.

a. Define *collaboration,* and explain why it is an important skill for business professionals.
Collaboration is working with others toward a common objective in a critical yet constructive manner.

b. Explain how you are using collaboration to answer these questions. Describe what is working with regards to your group's process and what is not working.
This will vary from student to student. There is no correct answer and the only incorrect answer is, "I did not collaborate to answer these questions."

c. Is the work product of your team better than the product any one of you could have produced separately? If not, your collaboration is ineffective. If that is the case, explain why.
Here again, there is probably no incorrect answer.

d. Does the fact that you cannot meet face to face hamper your ability to collaborate? If so, how?
This will depend on the student. Some students will find it advantageous, some will not.

e. Explain how Jennifer failed to demonstrate effective collaboration skills.
Jennifer failed to work with her colleagues, for the most part, at all. She failed to seek advice, to vet her ideas with her colleagues, to ask for clarification of job assignments, to brainstorm, etc. She basically failed to be what her employer would define as a colleague, let alone a collaborator.

f. Can people increase their collaboration skills? If so, how? If not, why not?
Yes, they can. Through practice, training, introspection, education, etc.
Some students may respond that this is not possible, and perhaps for some personalities, it is not. But for the majority, collaboration skills can be improved.

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4. **Experimentation.**
   a. **Define *experimentation,* and explain why it is an important skill for business professionals.**
   Experimentation is making a careful and reasoned analysis of an opportunity, envisioning potential products, solutions, or applications of technology, and then developing those ideas that seem to have the most promise within the resources you have available. Inherent in experimentation is learning from the results.

   b. **Explain several creative ways you could use experimentation to answer this question.**
   Answers to this question will be widely varied and hopefully creative. Once again, there are no wrong answers, but only answers that are poorly conceived. Example answers may include:
   - Write a definition of "experimentation" and then start a threaded discussion on a site like www.freeforums.org.
   - Use Twitter to tweet a definition to friends and contacts, and then gather feedback.
   - Post a definition on Facebook and gather further information from those who post replies on your wall.

   In each case, gathered feedback would result in modifications to the definition, posting the new definition, and gathering more feedback – basically, an iterative process of improvement.

   c. **How does the fear of failure influence your willingness to engage in any of the ideas you identified in part b?**
   This will be a very individualized answer, possibly different for every student. There is no wrong answer. Some may say, "I have no fear of failure." That may be true, but some may be paralyzed by it. The important thing is that students do a sincere introspection regarding their own level of fear of failure and consider the degree to which that may limit their life/career.

   d. **Explain how Jennifer failed to demonstrate effective experimentation skills.**
   Jennifer clearly indicated that she is "just not comfortable with that" when told by Kelly that the organization develops "ideas and then kicks them around with each other." That is a form of collaborative experimentation. She also failed to develop any of her own ideas, choosing instead to work on ideas from Kelly.

   e. **Can people increase their willingness to take risks? If so, how? If not, why not?**
   Fear of failure is actually the fear of the consequences of failure. Yes, people can increase their willingness to take risks, but they must know they are in an environment where taking risks and failing does not carry negative consequences. Jennifer was apparently in such an environment but was still unwilling to take risks and experiment. It is also possible that she truly didn't understand the nature of the work environment and the reward structure.

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5. **Job security.**
   a. **State the text's definition of *job security*.**
   Job security is "a marketable skill and the courage to use it." In today's environment of rapid technological change and zero data and information costs, strong non-routine cognitive skills are vital in creating the value that will create job security.

   b. **Evaluate the text's definition of job security. Is it effective? If you think not, offer a better definition of job security.**
   There is no correct answer to this question, although disagreement with the text's definition must be followed with a well-written definition that is broken down into well-defined and well-defended components.

   c. **As a team, do you agree that improving your skills on the four dimensions in Collaboration Exercise 1 will increase your job security?**
   The answer to this question must be yes.

   d. **Do you think technical skills (accounting proficiency, financial analysis proficiency, etc.) provide job security? Why or why not. Do you think you would have answered this question differently in 1980? Why or why not?**
   As defined in the text, these skills are classified as routine skills – skills that can be performed by any adequately trained person. While routine skills add value, the value is finite and stable. The opportunity for skills such as these to create new value is extremely limited.

   In 1980, the answer to this question would have been different, but the relative values of routine and non-routine skills were not different. Non-routine skills that create new value have always been considered of higher value than routine skills. However, in 1980, outsourcing of routine skills was not as common, so job security for routine skills was far better.

6. **Apply the models in Figure 1-6 to a company of your choosing. Specify the strength of each of the five forces, select a competitive strategy, identify value-adding activities, diagram a process, and describe the information system that will support your analysis.**
   Students' responses will vary widely depending on the industry they choose such as communication, auto, computer, construction, retail, manufacturing etc.

   Then the selected companies in the industry will also vary widely; a market leader or laggard, a big or small cap, quality or price driven.

7. **Using Google, find out how to follow experts on Twitter. Discuss as a team one potential job area that some of you are interested in working in after graduation. Have one person on your team log into Twitter. Find an expert on Twitter in that job area. Record the Twitter handle and an interesting tweet from this account.**

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Responses will vary widely depending on students' interests. Most selected jobs are most likely to be in a business functional area such accounting, finance, IT, etc.

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Case Study 1

Tesla: Driving Competitive Strategy

1-5. What is their competitive strategy?

Differentiation. Tesla focuses on differentiation. Tesla cars have many features that are unique and not available in other cars such as autopilot and hands-free self-driving capabilities.

Tesla also leads the industry in battery life and car performance. The high price tag of Tesla cars makes Tesla's strategy as a "focused differentiation" competitive strategy that targets high-end customers.

1-6. Which of the five forces affect the sports car industry the most? The least?

- The Most: Existing rivals. The sports car industry targets high-end customers who represent a small proportion of the auto market; so there is an intense competition among sports car vendors who compete with each other for the same limited number of customers.

- The Least: Threat of new entrant. Entering the sports car industry is not easy and requires substantial amounts of capital, equipment, technology, facilities, and resources. The auto industry is also heavily regulated; which makes entering into this industry extremely hard, costly, and a lengthy process.

1-7. Do you think it is ethical to test new technology such as autopilot features on the public? How should a company decide when it is safe to release a new feature that will drive sales?

In the early stages of testing, it might not be ethical to test new technologies on the public because the consequences may not be fully known. Using non-human objects such as robots is more appropriate for testing new technologies as Tesla.

After initial testing and experimentation, Tesla can develop better understanding of the technology and try to minimize or eliminate deficiencies and limitations of the new technology.

After the technology is evaluated, perfected, and known vulnerabilities have been eliminated, it should be test on real people because it will eventually be used by real people on real roads.

1-8. What other technology can or should Tesla use to make its cars safer?

Backup autopilot. Tesla should develop a kind of "backup autopilot" or another technology that should kick-in and start working if the main autopilot fails for any reason to avoid tragedies as that of Mr. Brown.

1-9. Which of the four employability skills are Tesla engineers demonstrating when they develop their self-driving features?

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Collaboration. Tesla engineers must have collaborated with each other and with manufacturers, suppliers, and research centers to produce this high-performance car. Development of the Autopilot software took a lot of collaboration among software engineers, programmers, and other engineers at Tesla.

Experimentation. Tesla engineers demonstrated a great deal of experimentation. They had a novel and brilliant idea and they were not afraid to experiment with idea and make a reality.

Systems Thinking. They also demonstrated system thinking by understanding all the components that are needed to make a self-driving car. In this process, the engineers also developed a battery system that is superior and last longer to batteries used by competitors.

Abstract Reasoning. Tesla engineers developed a lot of models for all aspect and components of the sports car.

1-10. Which of the company's value chain activities do you believe creates its greatest margin?

Operations/manufacturing**.** In the case of Tesla cars, the operations/manufacturing activity creates the greatest margin. In operation/manufacturing all inputs are processed and assembled to produce a unique and high performance self-driving cars.

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