CHAPTER 1

Accounting: Information for Decision Making

Solutions

REVIEW QUESTIONS

1.1 Step 1: Specify the decision problem, including the decision maker's goals.
Step 2: Identify options.
Step 3: Measure benefits (advantages) and costs (disadvantages) to determine the value (benefits reaped less costs incurred) of each option.
Step 4: Make the decision, choosing the option with the highest value.

1.2 Because people place different emphasis on factors such as money, risk, and leisure.

1.3 The benefits of an option less its costs. Because value is the contribution of an option to the decision maker's goals, we measure value relative to the status quo, which is not doing anything at all.

1.4 The value of the next best option.

1.5 An organization is a group of individuals engaged in a collectively beneficial mission. The key difference between individual and organizational decision making relates to goals – organizational goals rarely coincide with the goals of all individual participants.

1.6 (1) Policies and procedures; (2) Monitoring; (3) Incentive schemes and performance evaluation.

1.7 Planning decisions relate to choices about acquiring and using resources to deliver products and services to customers. Control decisions relate to motivating, monitoring, and evaluating performance.

1.8 Plan, Implement, Evaluate, Revise (PIER Cycle).

1.9 To help measure the costs and benefits of decision options.

1.10 Persons outside the firm. These individuals make decisions about buying and selling stock, lending money, dividends, and taxes.

1.11 Persons inside the firm. These individuals make decisions about which products and services to offer, the prices of products and services, what equipment to purchase, who to hire and how to pay them.

1.12 The primary users (external vs. internal), governing principles, the unit of analysis, emphasis, periodicity, and types of data considered.

1.13 Ethics relate to every step of the decision framework. Ethics can shape our goals, the options we consider, how we measure costs and benefits, and the ultimate decision we make.

1.14 The Foreign Corrupt Practices Act of 1977.

1.15 The key financial players include the CEO, CFO, controller, treasurer, and chief internal auditor. The roles of each player are described in detail in the appendix.

1.16 (1) Competence, (2) Confidentiality, (3) Integrity, and (4) Credibility.

DISCUSSION QUESTIONS

1.17 Your ultimate goal could be to earn as much as you can before you retire, say, 40 years after you graduate. With this goal in mind, you have to plan a career path and evaluate the three job offers to see which of these jobs will take you on that path. Besides pay, factors such as the reputation of the organization, the quality of on-the-job training you will get, opportunities to climb the organizational ladder are very important from a career perspective. If all three job offers are equally attractive in terms of the career you have chosen for yourself, then short-term goals and desires will dictate which job offer you should accept. All else equal, you will naturally want to accept the job offer that pays you the most, or you may be willing to accept slightly lower pay to live in a city that you like, or work for an organization with better reputation, and so on.

1.18 Yes, this statement is true. Opportunity cost is the value of the next best option. As more options become available, it is possible that a new option may be more attractive than the current best option, in which case the new option becomes the best option, and the current best option becomes the next best option. In this case, the opportunity cost *increases* but it can never decrease as long as all the current options are also available to choose from.

1.19 Let us assume that you are not fully prepared for your exam tomorrow (if you are fully prepared, then you might as well watch TV because you stand to lose nothing i.e., your opportunity cost is zero). By watching TV, you risk being unable to answer some questions and making a poorer grade in the exam. Thus, the opportunity cost is the lost benefit from not receiving a better grade that the preparation would have helped you secure.

1.20 Let us say that the full-time MBA program takes two years to complete. The opportunity cost of pursuing the program is the income she will be losing over this period by quitting her existing job, the experience she will lose from not being on the job for two years, and any promotions she may be foregoing.

1.21 Differences in individual goals can arise from:

- Differences in preferences: Some individuals place a greater weight on maximizing wealth, others place a greater weight on being the best in what they do (the two are not always perfectly correlated)
- Attitudes toward risk: Some have a greater tolerance for risk than others
- Differences in ethical thresholds: What is perfectly acceptable ethical behavior for some may not be acceptable to others.

A Casino is a good example of a business that exploits variations in individual tastes for risk. Casinos tailor their offerings to accommodate individuals with different risk tolerance levels – some involve high stakes where risks and returns are higher, and others involve low stakes.

1.22 This problem is an exercise in conditional probability. You have no choice but to pick a door at random in the first stage. Once the door has been opened you have only two options: Stay with your initial pick or switch. Let us evaluate the chance of winning with both options.

(1) Suppose you stay with your initial pick. Then, the following outcomes are possible

a. You initially picked the door that had the prize. Since you are staying with your choice, you win for sure.
b. You initially picked a door that did not have the prize. Then, because you are staying with your choice, you lose for sure.

Because the initial choice is random, the probability that you are in situation (a) is 1/3 and the probability that you are in situation (b) is 2/3. In situation (a) staying with your choice leads to 100% chance of winning and in situation (b) staying leads to 0% chance of winning. Thus, the probability of winning by following this strategy is 1/3*1 + 2/3*0 = 1/3.

(2) The key to computing the probability of winning in this case is to realize that the host will only open the door that does NOT have the prize. Then the following outcomes are possible:

a. You initially picked the door that had the prize. Then, if you switch, you lose for sure.
b. You initially picked a door that did not have the prize. Then, one of the two remaining doors has the prize. But, the host will not pick this door. He will only open the door without the prize, meaning that the closed door (which you did not pick) has the prize for sure.

The probability that you are in situation (a) is 1/3 and the probability that you are in situation (b) is 2/3. In situation (a) switching leads to 0% chance of winning and in situation (b) switching leads to 100% chance of winning. Thus, the probability of winning by following this strategy is 1/3*0 + 2/3*1 = 2/3! A random pick followed by switching doors is the smart choice.

This problem has vexed many people (do a Google search on "Monty Hall Problem") because the solution is counter intuitive.

1.23 The goal of a nonprofit hospital is to provide healthcare to the community it serves, without a profit motive. The goal of a university is to meet the educational needs of the community/country and to promote knowledge and discovery. Many universities also attract students from other states/countries as part of an outreach effort to promote diversity and learning. State universities are mostly government funded and do not have an explicit profit motive, but most private universities do. The goal of an honor society in a university is to promote academic excellence, diversity, and leadership.

1.24 The goal of a class is typically articulated in the syllabus – to effectively communicate the subject matter and its importance to the students, and to ensure that students leave the class with a good understanding of the concepts, principles and methods relating to the subject matter. Your individual goals might include learning the subject thoroughly and/or earning an "A" in the class. Goals can diverge. You may not be as interested in the subject matter as you are in getting an "A." You would prefer easier exams, and less homework. But your instructor may be more interested in your learning the subject matter and may assign you a lot of homework, and may administer tough exams. The instructor can motivate you by making you work hard, giving challenging tests, presenting the subject matter in a way that gets you interested, and offering a lot of help and guidance outside the classroom.

1.25 Sales commissions are a way to motivate sales personnel to strive hard to sell more. The more they are able to sell, the more money they get. The advantage of course is that revenues and profits increase for the organization. The disadvantage is that commissions often make the sales people follow aggressive tactics with potential buyers (you may have experienced this behavior in auto dealerships, department stores, furniture stores, and consumer electronics stores). Such behavior may turn away customers in the long run. Commissions also promote competition among sales personnel in vying for customers, which can prove counter-productive.

1.26 In wars and in combat situations, individuals have to depend on each other for survival. Working well in groups becomes a matter of life and death. So there is a natural alignment between team and individual goals. In a typical profit-making organization, the "free-rider" problem is more difficult to eliminate, because there is a natural incentive for each individual to contribute minimally to team goals and yet try to reap the full benefit. You may see this behavior when you work on group assignments for your class. Some individuals take responsibility and put in the effort needed, while others – realizing that the work is going to get done – do not contribute as much, and devote their time to other "productive" activities. The incentives are similar in profit-making organizations as well.

1.27 When we say "that wasn't too bad," we are essentially comparing what happened with what we expected would happen. That is, our expectations were not met. Most of us plan ahead, and sometimes things don't quite go the way we plan, for reasons beyond our control. In such instances, we adjust our expectations and then evaluate what actually

happened. For example, let us say you set out on a drive to Chicago from Bloomington, Indiana and you plan to cover the distance in 4 hours. But along the way, you run into unexpected rough weather, and it takes you 6 hours to reach Chicago. Given the driving conditions that you had to endure, you say to yourself "that wasn't too bad."

1.28 Yes, it does. There is a control problem in both scenarios. But in the first scenario the control problem is not related to divergence in goals, which is the case when you have to evaluate another individual's performance. A process can go out of control for reasons beyond your control, and all you can do is to fine tune the process. Feedback on how the process is going helps in this respect. In the second case, you have to control another individual's actions through monitoring or by providing appropriate incentives.

1.29 Financial statements of companies are in general very aggregate. They provide an assessment of performance over a period, say, a quarter or a year. They reflect the combined outcome of scores of actions taken by thousands of individuals within the organization over that period. They also report past performance and are not forward looking, which is what we need for decision making. Therefore, financial statements are not particularly useful for day-to-day decision making.

1.30 Yes, in general, this is true. Most accounting systems are designed to measure historical performance. However, the purpose of a management accounting system is to help decision making by providing reasonable estimates of opportunity costs. To the extent that trends in historical cost patterns can help in estimating future costs (or opportunity costs), even traditional financial accounting systems do help.

1.31 One could argue effectively that firms, interested in surviving in a competitive marketplace, would want to do so. By engaging auditors even if not required to do so, firms are signaling to investors that they have nothing to hide and that they are good firms to invest in. As another example, in this increasing global product markets, many companies seek third-party quality assurance (such as ISO 9000) to convey to all the markets around the world that their products are of high quality. Note that such third-party certifications are not required by governments.

1.32 This is a tough question. You face a difficult trade-off involving a troubling ethical dilemma. Many TV channels, especially family-oriented channels, would opt to not show the tape because it might hurt their viewership in the long-run, let alone cause emotional harm in the short run. Such channels do not face much of a trade-off. On the other hand, other TV stations, in particular cable channels, might well allow their profit motive to dictate their decision.

EXERCISES

1.33.

a. Microsoft corporation lists **"*[T]o empower every person and every organization on the planet to achieve more.*"** as its overarching mission. The firm also lists a variety of related goals and strategies, such as innovation, diversity and inclusion, AI, and trustworthy computing to accomplish this mission.

   Microsoft's goals and objectives are particularly noteworthy because they do not make explicit reference to the shareholders' ultimate goal of maximizing the return on their investment. There are at least two ways to view this.

   Some argue that, as a modern organization, Microsoft recognizes the claims of multiple stakeholders in the corporation arising because of the firm's size and impact on the economy. That is, the organization recognizes its obligations to parties such as its customers, employees, and society. A modern firm's mission statement reflects this broader view of the organization in which profit maximization is not the firm's only goal.

   Others argue that even the broader statements are a means to an end. For example, the goal of "trustworthy computing" or "AI" surely increases the market for Microsoft's products. Similarly, a firm may stress environment-friendly operations because doing so is good business. The focus helps the firm reduce costs (by reducing the risk of future litigation and payouts), increase revenues (by potentially enlarging the customer base), and comply with governmental regulations (thereby avoiding fines). Similar arguments apply for firms' attention to worker health and safety. Thus, one might view all of Microsoft's goals and strategies as being consistent with profit maximization.

   Both views are reasonable. The strength of your belief in the for-profit orientation of corporations determines your choice between the two extremes listed above.

b. The mission statement for the Metropolitan Museum of Art (popularly known as the Met) states:

   > "The mission of The Metropolitan Museum of Art is to collect, preserve, study, exhibit, and stimulate appreciation for and advance knowledge of works of art that collectively represent the broadest spectrum of human achievement at the highest level of quality, all in the service of the public and in accordance with the highest professional standards."

   This statement underscores the museum's not-for-profit motive and emphasizes the museum's mission on all aspects of the study of art.

   Both Microsoft's and the Metropolitan Museum of Art's mission statements take a broad view of the organization's mission. Microsoft's mission statement is very customer focused, whereas the Met's mission statement focuses on the art itself. The differing foci are

indicative of Microsoft's for-profit orientation (quality, innovative products, and customer satisfaction are all stepping-stones to profit) and the Met's orientation of increasing the appreciation for art (regardless of profit).

1.34. The credo for Johnson & Johnson states:

> **"**We believe our first responsibility is to the patients, doctors and nurses, to mothers and fathers and all others who use our products and services. In meeting their needs everything we do must be of high quality. We must constantly strive to provide value, reduce our costs and maintain reasonable prices. Customers' orders must be serviced promptly and accurately. Our business partners must have an opportunity to make a fair profit.
>
> We are responsible to our employees who work with us throughout the world. We must provide an inclusive work environment where each person must be considered as an individual. We must respect their diversity and dignity and recognize their merit. They must have a sense of security, fulfillment and purpose in their jobs. Compensation must be fair and adequate and working conditions clean, orderly and safe. We must support the health and well-being of our employees and help them fulfill their family and other personal responsibilities. Employees must feel free to make suggestions and complaints. There must be equal opportunity for employment, development and advancement for those qualified. We must provide highly capable leaders and their actions must be just and ethical.
>
> We are responsible to the communities in which we live and work and to the world community as well. We must help people be healthier by supporting better access and care in more places around the world. We must be good citizens — support good works and charities, better health and education, and bear our fair share of taxes. We must maintain in good order the property we are privileged to use, protecting the environment and natural resources.
>
> Our final responsibility is to our stockholders. Business must make a sound profit. We must experiment with new ideas. Research must be carried on, innovative programs developed, investments made for the future and mistakes paid for. New equipment must be purchased, new facilities provided and new products launched. Reserves must be created to provide for adverse times. When we operate according to these principles, the stockholders should realize a fair return."

The above statement underscores J&J's multi-faceted objectives. It recognizes obligations to customers, suppliers, employees, the community and shareholders. Interestingly, the statement places shareholders last, implicitly asserting that if we take care of the others,

shareholders will automatically earn a fair return. The importance of the credo to the firm also is evident by its placement on the firm's home page.

1.35.

a. For this decision, your goal is to minimize the amount that you pay over the semester for fitness – cost is your primary consideration.

b. Based on the information provided, you have two options:

   1. Join the fitness center for the semester at a cost of $80.
   2. Pay for the fitness center on a per use basis at a cost of $4 per visit.

   We also could include a third option – not using the fitness center at all (the status quo). However, it appears that you have rejected this option and are committed to using the fitness center in some fashion.

c. The cash outflow associated with option is:

   1. $80, or the amount it costs to join the fitness center.
   2. 16 × $4 = $64. (Since you plan on using the fitness center 16 times and each visit costs $4).

d. Given the available options, you are better off (to the tune of $16, or $80-$64) by **paying for the fitness center** on a per-use basis rather than joining the fitness center.

   Notice how the four step framework is applicable to "everyday" decisions, in addition to business decisions. Indeed, we could use the four-steps to frame every decision we make.

   Additionally, the timing of cash flow may be important – if a student has to pay the $80 all at once, then this reduces the attractiveness of joining as some students may not have the $80 to spare, especially at the beginning of the semester.

   Note: Uncertainty and beliefs might affect students' choices – for example, if students believe that there is a significant chance they will really get into an exercise routine and use the fitness center more often than once a week, then joining may be the best way to go. If students believe that they will use the center more than 20 times, then joining is the low-cost alternative (since 20 × $4 = $80). Further, some may pay the fee to motivate themselves..."I paid $80 and I need to get some return for it." However, as we will learn later, such thinking is a classic "sunk cost fallacy."

1.36.

a. Angela's goal in this decision problem is to make the most money or maximize profit.
b. Angela has three options:

(i) Raise the price of the Jelly donuts from $1.20 to $1.50 each.
(ii) Keep the price at $1.20 per jelly donut but make 100 more jelly donuts and 100 less chocolate donuts.
(iii) Not do anything.

c. Cash flow associated with option (i): Net cash inflow *per* glazed donut: $0.40 (= price of $0.80 – cost of $0.40). Net cash inflow *per* jelly donut: $0.90 (= 1.50 – 0.60). Net cash inflow *per* chocolate donut: $0.50 (= 1.00 – 0.50). Total expected cash flows to Angela from this option: 300 * $0.40 + 250 * $0.90 + 200 * $0.50 = $445.
Cash flow associated with option (ii): Net cash inflow *per* glazed donut: $0.40 (= price of $0.80 – cost of $0.40). Net cash inflow *per* jelly donut: $0.60 (= 1.20 – 0.60). Net cash inflow *per* chocolate donut: $0.90 (= 1.00 – 0.50). Total expected cash flows to Angela from this option: 300 * $0.40 + 350 * $0.60 + 100 * $0.50 = $380.
Cash flow associated with option (iii) = 300 * $0.40 + 250 * $0.60 + 200 * $0.50 = $370.
d. Based on the calculations in part c. above, Angela should raise the price of her Jelly donuts to $1.50.

1.37.

a. The cash outflow associated with scrapping the action figures is $1,000; as such, the value of this option is **($1,000)**.

b. Reworking the action figures will cost Toys Ahoy! $1,200, but selling them to the toy store will bring in $750 in revenues. Thus, the cash flow associated reworking the action figures and selling them to the toy store is $750 – $1,200 = **($450).**

Unfortunately, the value of both options is negative. However, relative to scrapping the toys, reworking them increase's Toys Ahoy!'s profit by ($450) – ($1,000) = $550. **Thus, reworking the action figures is the preferred option**.

c. Intuitively, the fact that Toys Ahoy! spent $6.25 to produce each action figure is **not relevant to the decision** at hand because Toys Ahoy! has already incurred the expenditure – it is a sunk cost.

1.38.

a. Parth's cash outflow associated with *Option 1* is $1,050 (airfare of $750 + one night hotel stay for $175 + other expenses of $125). With *Option 2*, Parths cash outflow would be $725 (car rental of $150 + two nights' hotel stay for $350 + other expenses of $225).
b. The opportunity cost of Option 1 is the value of Option 2, which is ($725). The opportunity cost of Option 2 is the value of Option 1, which is ($1,050).
c. The value of Option 2 is greater than its opportunity cost (i.e., $725 is lower in cost than $1,050). Yes, Option 2 is better for him based on the expenses given.

d. Well, drives can be long and exhausting, and Parthl may not feel alert at the conference. This is a "cost" that Parth has to bear with the second option. He might well feel that the extra $325 he has to spend is well worth avoiding strenuous driving. On the other hand, often fights get canceled due to factors beyond one's control. With driving, there is a little more control. This is an intangible benefit associated with Option 2.

1.39.

a. The following table provides the value of each of the four options that Usman faces:

	Option 1	***Option 2***	***Option 3***	***Option 4***
Revenue	$2,500	$5,000	$1,700	$0
Cost	700	3,800	250	400
Value (net cash flow)	$1,800	$1,200	$1,450	($400)

b. The opportunity cost of Option 1 is $1,450. The opportunity cost of each of options 2, 3 and 4 is $1,800.
c. Based on the data given, value exceeds opportunity cost only for Option 1 (the value of Option 1 is $1,800, its opportunity cost is $1,450).
d. Doing charity work may give Usman a tremendous amount of satisfaction that is immeasurable. The question is whether this satisfaction is worth more than $1,800 he stands to make by choosing Option 1.

1.40.

a. The three options available to Chloe are: (i) Status quo: Continue doing what she does and reject the job offer; (ii) accept the job offer, but don't work on computer repairs in the evening; (ii) accept the job offer, and continue repairing computers for her clients for two hours in the evening.
b. (i) Status quo option: Chloe's monthly income under this option will be $11,250 (=$75 per hour * 6 hours a day * 25 days a week).
(ii) Accept the job, and not work in the evenings: Chloe's monthly income will be $7,500.
(iii) Accept the job, and work in the evenings: Chloe's monthly income will be $10,000 ($7,500 + ($50 per hour * 2 hours a day * 25 days)).
c. The opportunity cost of the status quo option is $10,000. The opportunity cost of each of the other two options is $11,250.
d. Chloe should choose the status quo. The opportunity cost of this option is $10,000 (accepting the job, and continuing to work in the evenings.) which is less than its value of $11,250.

1.41.

a. The opportunity cost of any option is the value of the next-best option. Assume Jack could use the same color paint for another job. What's Jack's next-best option? The problem makes it clear that the paint is "unique" and has few, if any, alternative uses. Given this, Jack's

opportunity cost of using the paint for another job is **$0**. This estimate assumes that there is no cost to storing the paint.

b. Jack's next-best option is to dispose of the paint at a cost of $40. Jack can avoid this cost by using the paint for another job. Thus, the opportunity cost of using the paint for another job is **($40)**. Jack should therefore be willing to pay someone up to $40 to let him use the paint in their job.

c. The fact that Jack received a non-refundable advance of $350 does not change the opportunity cost in any way. The revenue and the cash costs are past events and are sunk. Both value and opportunity cost are forward looking – **because this amount does not change relative to the status quo, the $350 is not relevant to the decision at hand**.

1.42.

a. The incremental cost of carrying one additional passenger for Greyhound is very minimal. So the cash flow to Greyhound from issuing the ticket is close to $40.
b. The opportunity cost allowing the individual to travel is to leave with another empty seat. Therefore, the opportunity cost is zero as they are many available seats in the bus. The cash flow associated with denying the individual's request to travel is the opportunity cost of $40.
c. Yes. If Greyhound allows people to get on for a fraction of the ticket price just because there are still some empty seats, human tendency would be to wait till the last minute to get a cheap ticket. If everybody engages in this behavior, think of what would happen ahead of a bus leaving. Therefore, setting a firm ticketing policy and sticking to the policy pays off in the long run. In the short run, it may well be the case some seats will be unfilled, but the ticket price would be set appropriately in anticipation of such eventualities.

1.43.

a. Zap's decision problem centers on what to do with the 25,000 unsold "ZAP" kits. Zap's goal is to maximize profits. For the unsold 25,000 units, this means maximizing the revenue, or net cash inflow, received (number of units sold multiplied by the selling price per unit) from the sales of this product.

   It is important to note that the amount Zap paid to produce the 25,000 units, or 25,000 × $7.50 = $187,500 is sunk and is not at all relevant to their decision. From a financial accounting standpoint, this amount will be expensed on the income statement regardless of the option chosen.

b. Based on the information provided, Zap has two options:

   1. Sell the 25,000 units to the national home-improvement store for $7 per unit.
   2. Sell the product via the company's website. Under this option, the company expects to sell 60% of the remaining 25,000 units at a selling price of $9.95 per unit.

We could, of course, conceive of other options, such as discarding all of the "ZAP" kits or donating them to a municipality (for parks, etc.). However, it appears that Zap does not wish to explore these options.

c. The increase in Zap's cash flow under each option is:

	Option	
	1. Sell to store	*2. Sell via website*
Expected sales in units	25,000	15,000 (= 25,000 × .60)
Selling price per unit	$7.00	$9.95
Net increase in cash flow	**$175,000**	**$149,250**

Again, we note that the cost of producing the 25,000 units, or 25,000 × $7.50 = $187,500 is a sunk cost and is not relevant to measuring the net cash flow associated with each option. Moreover, we are interested in measuring the *future* sacrifices and *future* benefits associated with each option. The fact that Zap spent $187,500 to produce the 25,000 units is not relevant because the expenditure (and associated cash outflow) occurred in the past – it is a sunk cost.

d. Given the available options, Zap's preferred option is to sell the remaining 25,000 units to the home-improvement store for $7 a unit. Even though it appears that Zap will lose $7.00 – $7.50 = ($0.50) per unit, the company maximizes its cash flow and profit by selling the unsold units "at a loss."

Note: This exercise illustrates the classic price-quantity tradeoff – in this instance, the company is better off selling more units at a lower price than selling fewer units at a higher price. In other instances, the relation flips.

1.44.

a. The owners likely have multiple goals. Making a profit is important, as is winning games and championships. Some owners also probably enjoy the prestige and glamour associated with owning a professional sports team. Yet other owners wish to give back to the city and community by funding appropriate recreational outlets.

Each person in the coaching staff ultimately worries about his or her own career. Surely, the coaching staff enjoys what they do and being associating with "winners." However, some part of their concern about the team's success stems from its effect on their personal career prospects. Coaches are not as worried as owners about the team's overall profitability or other monetary issues.

Players have potentially conflicting goals. On the one hand, they wish to do what is best for the team. However, they also recognize that they have only a few years in their careers and that their earnings during this period must sustain them through their lives. Thus, players bargain aggressively with owners, sometimes putting team profitability in jeopardy. Such

actions may also create animosity among players and affect the team's effectiveness. For instance, a player may "hold out" (i.e., not report to training camps) for more compensation.

b. Teams can and do use a number of systems to align players' incentives with team incentives. Clauses giving incentive pay for reaching different levels of the playoffs and reaching milestones in performance (e.g., batting averages, rushing yards) are common. Contracts also usually specify parameters for physical fitness, as well as norms for expected behavior. Contracts often allow teams to 'fire' players if they engage in behavior that damages a team's reputation.

   Designing and implementing contract-based and formal control measures is difficult in this setting as team performance depends on many factors. It is often difficult to specify what players should do or to measure their contribution to the team's success. Teams therefore rely a great deal on intangibles such as "leadership" and "culture" when motivating players to do the right thing. Coaches sometimes discipline players by benching them for games or denying players time on the field/court. They also rely on the players' ego and the value players attach to their reputation to keep players in check.

1.45. Yes. This is a classic example of how a conflict of interests can come about. With respect her own evening work, Chloe is solely responsible for the quality of what she does. However, when part of a larger organization, there is some room for sharing and shirking one's responsibility. Naturally, we would expect Chloe to think about her own evening even as she is going through the motions of the day. So, the employer should be concerned. This is why employments contracts typically have clauses that prevent full time employees from taking on other jobs that would interfere with their work.

1.46.

Organizations invest in monitoring programs because the organization's goals may not always coincide with the goals of individual employees. When owners and other stakeholders delegate decision making, they run the risk that employees will make decisions that may not be in the organization's best interests. For example, employees may pad expense accounts, take excessive breaks or time off, or even steal from the company.

Monitoring can help by either penalizing undesired behavior or rewarding desired behavior. For example, mystery shopper programs help assess the quality of store operations and make sure that employees are following company policies. For example, a fast food franchisee may not keep the facilities up to the standards consistent with the franchisor's corporate image. Audit visits and other mechanisms serve to deter such behavior – in extreme instances, the franchisee could lose its license.

Just telling someone to follow the rules often is not enough. Enforcement or follow-up is necessary. Without enforcement, employees might simply agree to the rules but then ignore them and do whatever they want. Incentive schemes such as bonus pay and stock options also

help align individual goals with organizational goals.

1.47.

The following table provides the required classifications, including comments pertaining to the rationale underlying each classification.

Action/Decision	Stage	Rationale
Whether to hire two or three dental hygienists? Dr. Shapiro has narrowed his choices to two or thee hygienists based on expected patient volume.	**Plan**	This decision relates to the choice of a resource level. Hiring more staff provides greater capacity, allowing Dr. Shapiro to serve more patients, but also commits Dr. Shapiro to greater costs.
Prepare a staffing schedule so that at least one hygienist is available during all times the office is open.	**Implement**	This action relates to implementing the choice. The associated decision (we could view each possible schedule as a decision option) relates to how resources, in this case hygienists, will be used to deliver services.
Track the number of patients seen by each hygienist per week.	**Evaluate**	This on-going control process helps Dr. Shapiro figure out the efficiency and effectiveness with which he is using costly resources. Moreover, because Dr. Shapiro sees each patient during each visit, he also can personally track the quality of work done by each of his hygienists.
Re-evaluate the adequacy of current staffing levels.	**Revise**	Over several weeks or months, Dr. Shapiro will get a sense of whether his hygienists are fully utilized. He will also determine whether additional hygienists need to be hired or which, if any, of his hygienists need to be let go.

This problem illustrates the classical loop between planning and control. We typically begin with a plan that is based on a set of assumptions (in this case, expected patient volume). These assumptions are our beliefs about the unknown future. We then implement our choices. As time passes, we obtain new information about the actual outcomes (in this case, actual patient volume and the quality of work done by each hygienist). On an on-going basis, this new information will cause us to adjust how we implement our plans (e.g., change the schedule for the next week). Over a period, we will accumulate enough information to revise our original set of assumptions, which might cause us to revisit the decision.

The overall point is that there is a natural cycle of doing something based on a set of assumptions, comparing actual outcomes with expectations, and then revising our assumptions. In many instances, the broad loop relating to a decision contains smaller loops within it. For instance, we can think of creating each week's schedule as forming a separate planning and control cycle.

1.48.

The following table lists the four stages of the planning and control cycle and the associated decisions/actions. There are many possible decisions for each category.

Stage	Action/Decision
Plan	One possible decision is whether to price at the same levels as last year or to raise prices by, for example, 10% to account for the higher cost of flowers this year. Other decisions include whether to hire additional help or how much money to spend on advertising.
Implement	Based on the chosen price level, order and stock enough bouquets to meet the expected demand. (Notice that we could view this as a decision in itself, viewing each volume of order as an option.)
Evaluate	Compare actual sales to budgeted sales. Identify reasons for any deviations. (Again, we could view this as a decision by framing each possible reason for a deviation as a possible option. We then choose among possible explanations.)
Revise	Shari would use data on actual sales, her prices versus the prices of other florists, and national trends to revise her expectations about future sales. This revised belief will be a key input into her pricing decision for next Mother's day.

As we see, Shari begins with a plan that is based on a set of assumptions (in this case, how much demand she might expect for any given price). These assumptions are her beliefs about the unknown future. She then implements her choices (e.g., post prices, order flowers). As Mother's day nears, pre-orders and information about other florists' prices might give Shari an impetus to revise her prices. That is, she obtains new information on an ongoing basis, which in turn causes her to adjust her implementation (e.g., revise prices, run more ads). Over a period, she will accumulate enough information to revise her original set of assumptions, which might cause her to improve the next pricing decision.

The overall point is that there is a natural cycle of doing something based on a set of assumptions, comparing actual outcomes with expectations, and then revising our assumptions. In many instances, the broad loop relating to a decision contains smaller loops within it. For instance, we can think of offering a discount at day's end as forming a separate planning and control cycle within the overall cycle that we discussed above.

1.49.

a. We classify the data from the financial statements into three broad groups. We interpret financial statements broadly to mean any documentation filed with the Securities and Exchange Commission (SEC) or other regulatory bodies.

Financial data such as the firm's income and cash flow from operations are invaluable in assessing future prospects. The investor might also perform ratio analysis, such as computing the debt-to-equity and current ratio, to understand and explore a company's risk factors.

Governance data such as the composition of the board of directors and compensation arrangements help the investor assess the effectiveness of the company's management and control systems.

Finally, ***operating data*** such as the capacity of the plant, and the number of plants and employees help investors understand the business. Investors may also examine the firm's client base (e.g., does one client account for 10% or more of sales?). In addition, the management discussion of results section probably will discuss the company's pipeline of drugs and their potential.

b. Investors would consider the costs and benefits of *other* investment options. A firm's financial statements provide information only about its own affairs. Thus, the investor has to look elsewhere to assess the firm's relative standing (i.e., to assess the opportunity cost of investing in the firm). For instance, some competitor analysis is necessary to judge whether the firm is earning similar or higher rates of return than its competitors.

Investors also would likely collect data from pharmaceutical publications about the market potential for the firm's current and proposed drugs. For instance, financial statements might not reveal a lot about obtaining FDA approval for the drugs in-process. Medical publications and conference presentations might help refine these beliefs. Other data pertinent to market share and growth (from trade associations) also seem important.

Finally, considerations such as the extent of diversification provided and fit with the investor's risk-profile also play an important part in the investment decision.

1.50.

As shown in the table below, Emma may be surprised to find managerial accounting information invaluable in her new position. As a manager, Emma decides how best to use the organizational resources entrusted to her, and she will find both financial and non-financial

information from her company's managerial accounting system to be helpful for making these decisions.

Decision	Information Items	Are the information items financial/non-financial in nature?
Whether actual costs are in line with expectations?	Budgeted costs Actual costs Actual volume of production	Budgeted and actual cost data are financial in nature. Emma may use non-financial data such as the volume of production to adjust her estimates of expected costs. After all, the more units produced, the greater the expected cost as the company will be using more materials and labor. Emma also may rely on non-financial data such as absenteeism rates and whether her company was starting a new product to figure out the source of the cost differences.
Whether to make a tool in-house or buy it from a supplier?	Price charged by the supplier Cost to make the tool internally Supplier quality and reliability	The supplier's price and internal cost data are financial. Non-financial data include supplier quality and reliability, as well as the reliability and quality of the tools if they were manufactured by Emma's firm.
How many tools to purchase for making 100,000 units of a product?	Rate of wear Expected cost of tool Expected loss if tool not available	Use data, such as rate of wear, are non-financial. Cost data, which would be used to determine the amount of safety stock, are in financial terms.
What is the right inventory level for a given tool?	Expected rate of use, variance in use rates across time periods (e.g., Emma's firm may have seasonal production cycles) Cost of tool, cost of capital, other storage costs	Data concerning use patterns, including rate of wear and variance in use rates, are non-financial. Data about cost estimates, including storage costs and capital costs, are expressed in financial terms.

Whether to make a new tool or to refurbish an existing tool?	Cost to make the new tool Cost to refurbish existing tool Expected lives of the two tools Quality of the tools	Again, the cost data are in financial terms whereas data pertaining to quality and expected lives are non-financial in nature.

1.51.

Let us begin by computing the *expected cost* if you had stayed at a hotel:

Cost of hotel for one night	$140.00
Per-diem meal allowance	$100.00
Total	**$240.00**

Next, let us compute your *actual expenses*:

Cost of car rental	$80.00
Cost of dinner Wednesday	$90.00
Cost of other meals	$45.00
Total cost	**$215.00**

At least five views exist regarding the appropriate expense report:

- You could turn in a report for $240, arguing that the firm would have spent this amount for the trip. Any cost savings stemming from your actions should belong to you.

- You have saved the firm some money by staying with Maria rather than in a hotel. Thus, you should turn in a report for $215, justifying the dinner with Maria and the car rental as offsetting hotel costs.

- At another extreme, some would argue for a report of $45 only, being the actual meal cost. Under this view, the car rental and the dinner are personal expenses and non-reimbursable. Further, you should only claim the lower of actual expenses or the per-diem allowance.

- You could claim the $100 as the per-diem allowance for two days. After all, company policy allows you to claim $50 per day for meals, no matter what you actually spend.

- A final view is to claim the car rental and the per-diem for two days ($180 = $80 + 2 days × $50 per day), reasoning that the car rental is a reasonable off-set to the cost of the hotel.

As you can tell, there is no clear answer, and different people would reasonably claim different amounts.

Deciding the reasonableness of travel expenses can be difficult. For instance, some might argue that the cost savings are fictitious. You might have been more productive if you had stayed in a hotel and had a restful night. Spending time with friends might adversely affect your work quality the next day. In addition, perhaps you would have dined with clients or engaged in other beneficial activities (e.g., having dinner with colleagues to continue the meeting). These opportunities might have been missed because of your desire to have dinner with Maria. On the other hand, some might argue that the company is imposing costs by having you travel and spend time away from your family. Allowing you to spend time with friends and sightsee is one way to compensate for these non-pecuniary costs.

Many firms avoid these problems by formulating explicit policies. For instance, they might reimburse you $100 per day as a flat fee if you do not stay at a hotel.

This exercise nicely illustrates that there often is no bright line test for what is ethical or unethical. We can see this confusion in advice columns such as “Ask the Ethicist” that appear in the *New York Time*s Magazine.

1.52.

There are several available options. First, Sonja can bill the client for $5,000, reasoning that this is the “market rate” for the work. This option maximizes Sonja’s current income and reduces the chance that the client would be disgruntled after comparing notes. However, this option is unethical in the view of the American Bar Association (ABA). Specifically, ABA Formal Ethics Opinion 93-379 says that attorneys can only charge for hours actually spent, and for fees actually earned. It explicitly disapproves billing the second client for work already done, on the grounds that you have not "earned" the second set of fees. ABA Formal Ethics Opinions are not binding, but they are often influential in judicial proceedings.

Another option is to bill the second client for $1,250, the hours actually worked. Clearly, this strategy is ethical. However, it increases the chance of the first client being discontent. Further, the strategy is not fully consistent with Sonja’s goal of maximizing income — She is delivering a quality product for substantially below market wages.

What can be done? Note that the ABA Formal Opinion’s conclusion appears to be limited to hourly billing. Thus, a third strategy might be to arrange an alternative basis for billing the client. Notice that the client benefits from Sonja having already done the research and knowing how to do the work. Thus, if Sonja charges a flat fee, knowing that the work to accomplish the matter was already done and rendering her effective hourly rate higher than it would have been otherwise, that would probably be acceptable to the client and to the ABA.

(Of course, we are assuming that the ultimate fee is not "unreasonable.") In case she follows this strategy, Sonja will need to disclose to the client fully and honestly what the fee was and the basis on which it would be calculated. She might also be well advised to disclose to the first client (staying within bounds of client confidentiality) that she did find subsequent use for work that he believed to be unique. She might also consider giving some kind of a price break to the first client for future work.

More generally, when doing work that develops transferable skills or knowledge, good managers do not seek to extract all of the cost from the first client. Rather, they charge for less than the actual work done, "banking" some costs to be billed to future clients expected to benefit from the work. Of course, the client is billed to the full extent if the work is judged to be "unique" or "one-off." In either case, the key point is to stay in full, open and honest communication with the clients, and to be fair in appearance and in fact.

Note: We thank Professor Margaret Raymond of the University of Iowa Law School for helpful discussions on this topic.

PROBLEMS

1.53.

a. Given the hourly wage rate of \$15, 40 hours per week, and 12 weeks, the money earned for working as a checkout clerk this summer is:

Earnings – Working as a checkout clerk = 12 × 40 × \$15 = **\$7,200**.

b. First, we need to calculate the expected hourly compensation from waiting tables, which equals the base wage rate of \$8 per hour + tips. Your expected tips per hour = (.50 × \$6) + (.50 × \$10) = \$10 (i.e., there is a 50% chance you will earn \$6 in tips per hour and a 50% chance you will earn \$10 in tips per hour).

Thus, your expected hourly compensation = \$8 + \$8 = \$16. Given this wage rate, 40 hours per week, and 12 weeks, we have:

Expected earnings – Waiting tables = 12 × 40 × \$16= **\$7,680**.

c. Based solely on our computations in [a] and [b], waiting tables is the preferred option because it has the highest amount – you expect to earn \$7,680 from waiting tables this summer versus \$7,200 from working as a checkout clerk. The additional money from waiting tables is \$480 = \$7,680 – \$7,200.

The difference between the two options, however, is relatively small. Thus, we could readily see where individuals, based on what they value, might make differing job choices. For example, there is the risk associated with the tip component of being a waiter. A risk-averse person might take the sure thing of \$15 per. Alternatively, someone who is sure of his/her interpersonal skills may assess a much higher than 50% chance that they will earn \$8 + \$10 =

$18 per hour from waiting tables. Thus, the "wait tables" option may be more attractive than the checkout clerk option.

The nature of the two jobs also differs – as a wait person, you are constantly on your feet and moving – some individuals may (or may not) prefer this to the more sedentary role of being a checkout clerk, who typically is at his/her station for the better part of the day.

1.54.

a. Wynter has two options: (1) accept the $200,000 offer, or (2) reject the $200,000 offer and wait for a future offer. If she accepts the offer, then Wynter's opportunity cost includes the expected value of a bid from another buyer. In estimating this number, she has to factor in both the probability of receiving a higher bid and the value of the bid. She also has to factor in the time until the next bid arrives because, until the house is sold, she will incur costs to maintain the house, pay the mortgage, and accrue for insurance and property taxes (by accepting the offer, these costs will not be incurred). Finally, Wynter has to factor in the cost of the anxiety associated with selling a house – the house has to be clean all the time; plans to buy a new house may have to be put on hold. Many of these factors are qualitative and are based on beliefs about the future.

   Neither Wynter's initial purchase price of $225,000 nor the amount of time and money (which she values at $40,000) associated with developing a fabulous yard have any relevance in estimating her opportunity cost – both of these costs are sunk. Wynter currently has to assess future bids and future costs, taking as given the status of the market and her house's relative attractiveness. The fact that the house has not attracted a bid for a month indicates that the property may be over-priced at $275,000. All in all, Wynter may be well advised to give the offer serious consideration.

b. Wynter now has a third option – make a counter offer. This option may be preferred over an outright rejection because it preserves the option of going back to the original offer price but holds the promise of obtaining a higher price. In making the counter offer, Wynter has to estimate the final selling price, which would likely result after several offers and counter-offers. This estimation depends on Wynter's assessment of the *buyer's* opportunity cost. Wynter also has to factor in the probability that the sale might fall through because the buyer may come across a better value (from the buyer's perspective). Overall, Wynter faces a difficult, and highly subjective, decision. A realtor can often help in such situations by bringing Wynter the latest market information and the experience of pricing many such transactions.

1.55.

a. As stated in its website, the mission of the United Way is to improve lives by mobilizing the caring power of communities around the world to advance the common good. The United Way helps raise funds for well over 1,000 community-based organizations, each with its own board and volunteers. Other major charities have equally laudable goals.

b. There is little doubt that the officers and staff subscribe to the charity's goals. Usually, these are talented individuals with multiple employment and lifestyle options. They often make significant financial and professional sacrifices to work for the charity, perhaps because of the satisfaction they derive from advancing a goal they believe in.

   However, the officers are also individuals with their own wants and needs. While they may be willing to work for a smaller salary or under harder operating conditions, they cannot typically work for a nominal sum. The question therefore turns on what is "appropriate" compensation and not whether they need to be compensated or not.

   To answer this question, notice that charities such as the United Way are large organizations that control significant assets (the United Way receives billions of dollars in contributions) and operate in a highly complex political and economic environment. For instance, the United Way organization itself (not the member organizations) uses the services of several hundred professional staff and consultants. Discharging these responsibilities is not a trivial task and requires the services of competent managers. Competitive market conditions determine the "going rate" for such professional managers. Often, charities will engage outside consultants and reviewers to help them assess what is and is not appropriate given the charity's operations and the individual's skill set. Seen in this light, we can justify an annual compensation package in the hundreds of thousands of dollars for the CEO of a large charity.

1.56.

a. Compare selling 225 confirmed seats to selling only 210 seats. If the airline only sells 210 seats, then there is high likelihood that not all 210 passengers will show up. In this case, the plane will have one or more empty seats. If these seats could be filled with paying passengers, then the airline's profit increases – there are few additional costs associated with the extra passengers. The chance of lost profit due to empty seats decreases as the airline sells more than 210 seats.

   The airline must balance this cost with the cost of bumping passengers. If the airline sells 225 tickets, then there is a chance that more than 210 passengers will show up. The airline has to provide compensation to the bumped passengers. The additional rewards (e.g., a travel certificate, hotel accommodations, meal vouchers, etc.) and negative goodwill reduces the airline's profit.

   Airlines use sophisticated models to estimate these two costs and to determine the "optimal" number of seats to sell. (For instance, they would not sell 300 tickets on a 210 seat flight.) Historical records help agents tailor the amount of overbooking to the time and the day of the flight, as well as to the profile (business/vacation/family) of the average passenger.

b. If bumped, the passenger gives up the confirmed seat. The major cost of being bumped is the convenience associated with traveling on the scheduled flight and arriving earlier at the destination. This cost varies widely across passengers, resulting in some rushing to the podium to claim their reward while others wait. For instance, a college student going home

for the holidays probably is more willing to give up the seat than a businessperson attending an important meeting. That is, cost and value are specific to each individual's goals.

c. Like the airline, the passengers are trading off benefits with sacrifices. Suppose the current reward exceeds the costs associated with taking a later flight. You know (from prior experience) that the reward increases with time. You therefore decide to wait to get the maximum possible reward. However, waiting has a cost. Another passenger may volunteer before you and claim the (lower) reward. In this case, the option of giving up your seat expires, and you have given up the chance to get a reward (which had positive value). You must subjectively tradeoff these two factors when deciding whether to claim the current reward or to wait for the next reward level.

   Note: We consider *expected* costs and benefits, when unknown future events (will someone else volunteer first?) affect our realized costs and benefits. The problem also illustrates the role of uncertainty when making decisions.

d. If a passenger is *involuntarily* bumped, the cost of missing the scheduled flight exceeds the offered reward. That is, the airline is imposing a cost on the passenger by involuntarily removing them from the flight. This cost will translate into ill will, damage to public image, and future lost business for the airline.

   This cost varies across passengers. The potential cost is much higher if the airline bumps a full fare-paying businessperson who travels every week than if the airline bumps a discount-fare passenger who is traveling alone and who is not a frequent flier. Bumping part of a group is more expensive (image wise) than bumping single passengers. Individual circumstances again shape the airline's costs.

   Naturally, airlines consider these variations when picking passengers to bump involuntarily. Airlines develop detailed passenger profiles to help the ticket agent select passengers – the airline's options include the set of all passengers with confirmed seats and the decision is which one to pick.

1.57.

a. For this decision, Mei has two options: (1) keep the old TV, and (2) sell the old TV and buy the new HDTV. (Mei has ruled out the possibility of keeping both TV sets). The option of keeping the old TV really just postpones the problem to a later date. Mei can always sell the old TV a year from now and purchase the new HDTV (of course, the resale value of old TV and the price for the new HDTV would change in a year).

   Mei should consider the following costs and benefits in her decision:

   Cash outflow associated with purchasing the HDTV: Mei can objectively estimate this cost – it is \$1,699 + (0.06 × \$1,699) = \$1,800.94. This cost will only be incurred if Mei purchases the HDTV.

Cash inflow associated with selling the old TV: Mei can objectively estimate this benefit – it is $600, or the amount the neighbor is willing to pay Mei for her old TV. Mei will only receive this money if she purchases the HDTV.

Better quality picture and sound: This is the primary benefit associated with the new HDTV. Mei must subjectively estimate this benefit.

Utility from being current: Many persons derive utility from their "toys" such as cars, stereos, boats, televisions, etc. Mei might be such a person and receive a psychological benefit from owning a "cutting-edge" HDTV. Similar to better quality picture and sound, Mei must subjectively estimate this benefit.

Mei's decision hinges on whether the qualitative benefits associated with being current and having a better quality picture and sound exceed the net monetary cost associated with purchasing the new HDTV. In other words, if Mei estimates that the benefits exceed $1,800.94 – $600, or $1,200.94, then she should purchase the HDTV; otherwise, Mei should keep her old TV. *Different people will attach different weight to the qualitative factors and, thus, make different purchasing decisions.*

Notice that the $1,500 purchase price of Mei's current TV does not factor into Mei's decision. It is a sunk cost and, consequently, is not a relevant cost or benefit.

b. Mei may owe money on her old TV if he purchased it on an installment plan (e.g., he financed it with a store credit card). Notice that Mei would owe the store $300 regardless of whether she keeps his current TV or buys the new HDTV. Hence, the $300 is not relevant to Mei's analysis and should have no impact on his decision to purchase the new HDTV.

Note: Installment contracts frequently contain clauses that, in this instance, would give the store a lien on the TV set. This clause may require Mei to pay off the balance if she sells the TV. Such a requirement affects Mei's cash flow and, in turn, could affect her decision. The effect in this instance arises because of Mei's constrained budget. Absent such a budget constraint (i.e., if Mei had enough cash to pay off the loan and to purchase the new HDTV), the amount is not relevant.

c. In this case, Mei has three options: (1) keep the $600 and not replace the TV, (2) use the $600 to replace his old TV, and (3) use the $600 toward the purchase of the new HDTV. Compared to part [a], we see that Mei has more options. However, Mei's option of keeping the old TV is no longer available.

The value associated with purchasing the HDTV, however, has not changed. Before the flood, Mei had to pay $1,800.94 – $600 = $1,200.94. After the flood, Mei still needs to pay $1,200.94 to purchase the new set. In both cases, Mei has $600 to assist with the purchase of the HDTV – it doesn't matter where the $600 comes from.

Note: We believe that many people who would have stayed with the old TV in part [a] would purchase the HDTV in part [c], even though the value has not changed. While value has not

changed, the problem is *framed* differently. Part [a] frames the problem as selling the old TV to get a new TV. In part [c], the decision is whether to spend $600 to get a dated TV or $1,800.94 to purchase a state-of-the-art HDTV. Although there is no economic rationale for the phenomenon, psychologists have demonstrated that differences in framing often lead to differences in decision making.

1.58.

This problem captures some of the complexities in administering a complex organization such as a university in a resource-constrained environment. The following costs and benefits seem relevant.

Notice that there is very little in the form of incremental revenue to the school as tuition revenue is independent of Dean Maxton's decision. One could possibly argue that the decision could affect future donations to the school (e.g., a student becomes rich and attributes his/her success to the school and the Dean's decision to open up the course to additional students). This seems unlikely, however, leading us to consider the direct out of pocket costs vis-à-vis a qualitative assessment of the educational benefits.

The direct costs in this problem are relatively easy to measure. These costs only include the cost of the instructor in option 2. If, for some reason, the school's budget is tight and the school is not in a position to bear this cost, then the Dean would have to choose either option 1 or option 3. More than likely, though, this cost would not limit the Dean's options.

Thus, the decision seems to hinge on the educational tradeoffs and maximizing student welfare. Delineating the educational tradeoffs, or even defining student welfare, is a rather difficult and subjective task. The Dean will have to measure and weigh the following factors in each option to arrive at the value of each option:

Option 1: What are the costs of not appearing to be responsive to student needs? What are the lost educational benefits, if any, of capping the enrollment in the Strategic Cost Management? Are there other high quality courses offered by the school that lead to the same, or similar, level of educational benefits? How costly is it for students to delay taking the course by a semester or a year?

Option 2: What are the costs of canceling a class that is "on the books?" Here, the Dean needs to consider the costs to the six enrolled students in the canceled class as well as any costs associated with the school reneging on what many might view as a commitment. Further, in addition to the direct costs of hiring the instructor, the Dean needs to consider whether the quality of instruction in the course would decline – that is, will the new instructor deliver the goods? The Dean must weight all of these factors against the incremental educational value of offering the Strategic Cost Management course to the 15 students who wish to take the class.

Option 3: There are unlikely to be any costs or benefits for the 19 students enrolled in the other course. Thus, Dean Maxton needs to assess the incremental benefits associated with

allowing the 15 students to take Strategic Cost Management versus the cost to the 20 students currently enrolled in the course (e.g., due to the instructor changing to a lecture-oriented teaching style and change in exam format).

Ultimately, the Dean's decision hinges on the qualitative factors, even though these factors are difficult to measure with any reasonable degree of accuracy. Overall, it is likely that the Dean would choose option 3 since the incremental benefits are likely to outweigh the incremental costs, whereas the costs in options 1 and 2 likely overwhelm any benefits. This is simply our conjecture, though. One can make plausible arguments to support choosing any of the options.

1.59.

a. Your decision problem relates to buying the "best" computer, with your goal being to obtain the maximum value from your computer purchase. Individual preferences dictate the definition of value. For example, some students may place a premium on price, desiring to obtain a computer that performs the basics for the lowest possible amount. Other students may place a premium on mobility or, alternatively, worry about the potential for theft and loss. Finally, some students may emphasize computing power or monitor size. The key point to remember is that "value" is measured with respect to an individual's preferences.

b. A narrow definition yields two options: (1) A desktop machine, and (2) a laptop machine. A broader definition might include a laptop with a docking station, which gives us a hybrid of a desktop and a laptop.

   It also is important to recognize that external factors ("constraints") may limit you from considering other options. For example, a budget of $600 is likely to rule out most laptop machines. If taking notes in class is the primary role for your new purchase, then desktops would be eliminated. At an extreme, some schools specify that you choose among limited configurations from a "vendor of choice," a constraint that also limits your options.

c. There are numerous costs and benefits to be considered – the following are perhaps the most salient:

   Price: For equivalent computing and storage power, laptops are more expensive than desktop machines.

   Computing power. By virtue of their size, desktop machines offer features (microprocessor speeds, RAM amounts, ability to handle add-on equipment via their multiple ports) unavailable in laptop machines.

   Monitor size, Video Cards, & Speakers. We can configure desktop machines with larger monitors and better video cards and speakers. These features may be particularly important to students who plan to use the machine for gaming and/or watching movies.

Mobility: We can more easily move laptop machines; they can be used in the classroom, library, cafeteria, and so on.

Safety: Unfortunately, laptop machines can "grow feet." That is, they are far more susceptible to theft and loss.

d. Because many of the costs and benefits are qualitative, they will vary across individuals. For example, students who are always "on the go" may assign more weight to mobility, and therefore be more likely to purchase a laptop. Similarly, students who love video games may assign more weight to monitor size and the quality of the video card and speakers, and therefore lean towards purchasing a desktop.

In the end, each person will add up all of the benefits and subtract all the costs of each machine type, selecting the option with the highest personal value.

1.60.

a. The objective is to obtain the maximum value from your vacation. Individual preferences dictate the definition of value. For example, some individuals may place a premium on outdoor activities, desiring a vacation that involves golf, scuba diving, fishing, hiking, or camping. Other individuals may place a premium on rest and relaxation, desiring to vacation at a spa or resort where guests are pampered. Other individuals may place a premium on visiting a foreign country or city, visiting historical sites and monuments, or cultural events. Finally, some individuals may place a premium on cost, desiring simply to take 14 days off for the lowest possible amount.

Even though you might share many interests, you and your friend's objectives are unlikely to be perfectly aligned. By definition, groups comprise multiple individuals, each with unique preferences. The group's preferences are some aggregation of individual preferences. As discussed in the text, goal congruence is the overlap between the group's and the individual's goals and is rarely perfect. Each individual in the group therefore will try to push the group to make the decision that maximizes his or her own well being. Because of differences in individual preferences, this can lead to different individuals pushing for different choices.

In this instance, even though you are best friends, it is likely that each of you attaches differing values to different options. There is both a group and a personal decision here. Each vacation possibility must be evaluated in terms of the relative benefits it yields to both parties involved. For example, consider trips to Yellowstone National Park, the Grand Canyon, or the Smokey Mountains of Tennessee. Being a white water enthusiast, you may prefer the Grand Canyon trip to the others. Your friend may prefer the Smokey Mountain trip because of his/her enjoyment of quiet long walks and greenery. As a group, you may settle on the Yellowstone trip although it is not the first choice for either of you; it offers a bit for both of you.

b. The option set here is very large and consists of all possible vacation destinations. Realistically, decision makers "prune" the option set by eliminating an entire class of choices. For example, you and your friend may restrict your choice to outdoor activities, thereby eliminating a host of other vacation possibilities (a week in New York City, for example). Alternatively, you and your friend may restrict your choice to European cities or warm weather places (thereby eliminating U.S. vacation destinations and cruises to Alaska, respectively).

   It is very difficult, if not impossible, for a decision maker to consider more than a few choices. Almost all decision makers narrow their options to a manageable number. Good managers, however, try to make sure that the options they retain dominate those they eliminate.

   It also is important to recognize that external factors (constraints) may limit the options you consider. For example, a budget of $2,000 for the vacation is likely to rule out a week at the Plaza hotel in New York City. (The room rate is several hundred dollars per day) or a week of golf at Pebble Beach (the green fee is $500 per person per round).

c. There are numerous costs and benefits to be considered – the following seem salient:
   Price: This is important to just about everyone and can severely limit one's options. Most individuals wish to avoid spending a significant amount of their annual discretionary income on one vacation, desiring to save money for other goods such as car, television, clothes, and food.

   Time: Most individuals are very conscious of the amount of time the vacation will take – for example, because of job constraints few individuals could take a 3-month tour of Europe. Additionally, individuals likely will consider the amount of time spent traveling and the amount of time actually spent at the vacation destination, wishing to minimize the former and maximize the latter.

   Mode of Travel: Some persons are nervous about flying and may not take any vacation that involves air transportation.

   Activities: What you will be "doing" on vacation, be it fishing, camping, or visiting historical sites, is clearly important (as discussed above).

   Location, Uniqueness: You may attach value to visiting a place you have never been before and/or doing something "different" from the norm.

   Crowds: Some persons like to vacation in relative isolation whereas others are less concerned about long lines.

d. Because many of the costs and benefits are qualitative, they will vary across individuals. Indeed, there are a plethora of places to vacation, and we see people making different vacation choices all the time. In the end, you and your friend will add up all of the benefits

and subtract all the costs of vacation destinations in your option set, selecting the one with the highest value.

Again, it is important to remember that (as discussed under part [a]) you and your friend will likely attach differing values to the different vacation options. Thus, your final vacation destination is likely to reflect a compromise between what you truly desire and what your friend truly desires. Many students will likely recall that this happens all the time with family vacations where the preferences of the children and adults do not coincide – invariably, some compromise is struck.

1.61.

a. Nate's decision problem centers on what to do with the unsold merchandise. Nate's goal is to maximize her profit. For the unsold merchandise, this means maximizing the revenues received from selling the merchandise less any additional costs associated with selling the merchandise. The amount that Nate paid for the unsold merchandise, or ($100,000 – $65,000) × .50 = $17,500 is sunk and is not relevant to Nate's decision.

b. Based on the information provided, Nate has 5 options:
   1. Store the unsold merchandise for 10 months and attempt to sell it next season.
   2. Hold an 80% off sale.
   3. Hold a 70% off sale.
   4. Hold a 60% off sale.
   5. Hold a 50% off sale.

   We could, of course, conceive of other alternatives such as donating all of the unsold merchandise, but Nate does not seem to be interested in evaluating these options.

c. The increase in Nate's cash flow under each option is:

1. Store and Sell Next Year:		
Revenue next year	($100,000 – $65,000) × .30	$10,500
Packing and storage costs		(4,000)
Increase in cash flow		**$6,500**

	Hold January after-Christmas Sale			
	2. 80% off sale	*3. 70% off sale*	*4. 60% off sale*	*5. 50% off sale*
Remaining revenues at original price	$35,000	$35,000	$35,000	$35,000
Discount = % off × $35,000	28,000	24,500	21,000	17,500
Revenues at discounted price	$7,000	$10,500	$14,000	$17,500
% of items expected				

to be sold	100%	80%	55%	40%
Increase in Cash flow	**$7,000**	**$8,400**	**$7,700**	**$7,000**

Note: We focus on cash flows in this problem, rather than profit, because the cost of the merchandise is sunk and not relevant to the decision at hand. Moreover, if Nate were to focus on profit, we would [erroneously] calculate the value of each option as being negative as the amount Nate paid for the unsold merchandise exceeds the proceeds received from sale. What we need to remember is that the cost of the unsold merchandise will be expensed even if Nate were to do nothing and hold onto the merchandise (the status quo) – that is, he would have to write it off due to obsolescence.

d. The opportunity cost of each option is the value of the next best option. Thus, we have:

1. $8,400
2. $8,400
3. $7,700
4. $8,400
5. $8,400

e. Given the available options, we find that Nate's best strategy is to hold a "70% off" sale. This strategy nets Nate $700 more than the next-best option, which is the 60% off sale. Moreover, this option is the only one whose value exceeds its opportunity cost.

You can take the problem a step further and link it to common business practice. Specifically, we often observe stores using a "staggered" discounting strategy – the store starts with, for example, a 25% discount and increases the discount rate over time (perhaps by as much as 15-25% a week). In this way, the store attempts to capture as much consumer surplus (total revenues) as possible by stratifying customer types according to their willingness to wait and run the risk of having the item selling out. Such a strategy may work quite well for Nate – notice in the problem above Nate could sell 40% of the items if he offers a 50% discount. Nate could then sell an additional 15% of her merchandise by increasing the discount to 60%, and so on until he sells all of hmerchandise. By using such a strategy, Nate might be able to earn as much as **$13,125**, calculated as follows:

Sequential Strategy	*Detail*	*Revenues*
50% off	$35,000 × .50 × .40	$7,000
60% off	$35,000 × .40 × .15	2,100
70% off	$35,000 × .30 × .25	2,625
80% off	$35,000 × .20 × .20	1,400
Expected Revenues		**$13,125**

1.62.

a. Casinos monitor their employees because of the divergence between its goals and its employee's goals. The casino's goal, which is to maximize profit, is at odds with employees' goals, which is to maximize their personal wealth. Without monitoring, employees would be tempted to increase their own wealth by stealing money and chips. Such concerns are particularly salient in casinos because employees handle large sums of money and, without monitoring, could easily hide the theft by simply claiming that a patron was lucky and won the money.

   Casinos therefore monitor their employees to reduce losses associated with employee theft. Casinos can use both proactive and reactive controls to reduce this loss. Proactive controls include video surveillance, physical monitoring by floor supervisors and pit bosses, lock and key devices for slot machines, safe-keeping of high-value chips by sliding them into a locked cabinet, tracking gains and losses and comparing them to peer data, and using background security checks. Reactive policies could include firing or prosecuting employees caught cheating. As we see, there are many means casinos use to stop employees and patrons from cheating – the number is limited only by management's creativity.

b. Relative to physical monitoring, video monitors are less intrusive. The casino wants to provide a friendly environment where patrons feel at ease and are more willing to gamble. Patrons may not like having obvious "security" types hang around. Another advantage is that video feed can be recorded. This allows events to be reviewed and makes for compelling evidence in a court of law (while security staff can also testify, their memory is more fallible and less objective). Finally, the casino must also monitor the security guards themselves to prevent them from colluding with other employees to cheat the casino.

   Video monitoring, however, does have some drawbacks. First, having a visible security presence may alter people's behavior and make them more prone to obeying the rules. We all have slowed down when we see a patrol car in the distance. The patrol car therefore serves a useful role, even if aerial monitoring from a helicopter is more effective at identifying speeders. Second, video monitoring may be more expensive than hiring security guards. Finally, it may be more difficult to pick up subtle behavioral and body language type clues from a video monitor relative to direct observation. In this regard, physical monitoring may be more effective than video monitoring.

c. Multiple monitoring systems make sense because, as discussed in part [b], any given system is likely to have some weak spots. The use of multiple systems increases the probability that *any* improper behavior will be detected and corrected. The best mix of monitoring systems depends on the specific circumstances. For example, casinos rely heavily on video surveillance because individual employees continuously receive and pay out large sums of money without physical or electronic documentation (such as a receipt). A fast-food chain, on the other hand, is less likely to use video surveillance because employees monitor each other (i.e., work closely together), handle less money, and transactions with customers are better documented (e.g., all customers receive a receipt for their purchase) – in this case, the best control may be to reconcile the money in the cash drawer with the tape total at the end of each day or shift.

To understand this point better, consider why your instructor may use both multiple choice and essay questions on exams. Each type of question is advantaged in testing one aspect of learning. Multiple choice questions are easy to grade and can test "fact learning" very well. Essay questions test student understanding and integration of material, making them much harder to grade. Because both types of learning are important, an instructor may use both types of questions.

Note: Another factor to consider is the concept of diminishing marginal returns. Thus, we usually find a portfolio of controls rather than one control alone.

1.63.

a. Felix has four options:

- Do not paint the bedrooms now.
- Paint the bedrooms by himself.
- Paint the bedrooms with Oscar's help.
- Contract out the painting job.

b. There appears to be little conflict between Felix's and Oscar's objectives. Both individuals wish to have a good quality paint job. This congruence in objectives, however, does not imply that monitoring is not needed. Felix would do well to monitor Oscar's progress and work quality. The purpose of this monitoring is to provide feedback and to improve quality (improve Oscar's skill as a painter) rather than to evaluate Oscar's performance.

Translating to organizational settings, we must pay attention to the purpose of the monitoring mechanism when choosing the mechanisms. A system that is appropriate for monitoring performance may well be ill-suited to provide diagnostic and feedback information.

c. Felix and the contractor have differing objectives. The contractor's objective is to make a profit. The contractor can do this by delivering just the quality (the average customer cannot discern the difference between good and excellent quality) that the client demands, and by taking the least amount of time possible. Felix, on the other hand, cares deeply about quality. Unless Felix is very careful to spell out his quality expectations, it is likely that there will be a dispute about job quality. Performance evaluation is the key role for control measures and monitoring in this setting.

Note: It is worthwhile to contrast the differing roles for monitoring in the two settings. Usually, the purpose of monitoring is to ensure compliance with policies and procedures. Such monitoring is required because organizational and employee goals differ. For example, attendance records ensure that employees show up on time. This role for monitoring does not exist with Oscar but does with the contractor. Although Felix is likely to assess quality in both settings, the purpose differs.

It also is possible that some types of evaluations contain both performance assessment and feedback aspects. Some instructors give tests both with the objective of testing student's knowledge and with the objective of helping students figure out what they know and what they do not know. The former is the evaluative aspect of the exam while the latter is a feedback role.

1.64.

It is true that, as a result of the bonus contract, Adele has a direct interest in maximizing the Diamond Jubilee's profit. Thus, the bonus contract does help align Adele's interests with those of the casino. However, the bonus contract may not fully align Adele's interests with those of the partnership; there are at least two areas of concern:

1. Adele and the partnership may have different time horizons. Adele may be more interested in maximizing today's, or short-run, profit because, for example, she is close to retirement, she is planning to move, or she is planning to switch jobs. On the other hand, the partnership probably is more interested in maximizing the long-run stream of profits, or the present value of future cash flows accruing to the casino.

Such differences in time horizon could lead Adele to take actions that increase current profits at the detriment of future profits. For example, Adele may not invest in new equipment (e.g., slot machines or other gaming devices) or may defer maintenance or upgrades to the riverboat because such actions would increase expenses, thereby reducing current profit and Adele's bonus. The partnership, however, may prefer such actions be taken to ensure the long-run vitality and success of the casino.

Differences in time horizon also may lead Adele to not invest in increasing customer loyalty and goodwill. For example, Adele may not offer casino patrons discounted (or free) rooms. While such actions may increase short-term profits (because they reduce the casino's costs) they may jeopardize long-term profits because it has been shown that offering comps gets people (and their friends) to come back to the casino.

2. A second source of discord may arise because Adele's contract appears to encourage her to consume many perquisites. Adele may be motivated to consume perquisites because she receives all of the benefits while only bearing 5% of the cost (i.e., her lost share of profit).

For example, if Adele orders a new chair for her office that costs $1,000, Adele gets exclusive use of the new chair and it only costs her $1,000 × .05 = $50 in lost bonus income (while casino profit goes down by $1,000). Adele may decide that, at $50, the new chair is a bargain – casino partners, though, may view the matter differently. Analogously, Adele may be motivated to give herself a larger office and/or give her friends and relatives free meals. Finally, Adele may even engage in unethical and illegal behavior such as falsifying receipts and expenses. For example, if Adele submits a false receipt asking for a $500 reimbursement, Adele receives the $500 less the $25 reduction in her bonus ($500 × .05 = $25) = $475. We see that Adele's contract is indeed imperfect.

These examples show that Adele's interests are not fully aligned with those of the partnership. Accordingly, it probably would not be in your best interest to delegate all decisions to Adele and give her complete control of the casino.

Moreover, the lack of incentive alignment may increase the need for additional performance measures (above and beyond linking Adele's compensation to casino profitability) to ensure that Adele acts in the best interest of the partnership. First, you probably would restrict the decisions Adele could make – for example, you may require her to obtain approval before she purchases a chair or submits an expense report. You also may form a committee to oversee capital expenditures and improvements related to the riverboat and the gaming equipment. Second, you may decide to more closely monitor Adele. For example, you may engage both external and internal auditors to ensure that all physical and financial controls are in place and that no-one has undue access to, or influence over, the books. Finally, you may wish to gather data regarding how the numbers from the Diamond Jubilee stack up against the numbers from similar casinos – such benchmarking data can provide valuable insights regarding how your casino (and employees) are performing vis-à-vis other casinos and their employees.

1.65.

a. There clearly is some value to teaching boys the value of work and the dignity of labor. However, the State's objective of "reforming delinquent youth" probably encompasses turning troubled kids into productive members of society. It is unclear how digging holes accomplishes this objective – i.e., how it will lead troubled kids to not commit crimes, find gainful employment, and acquire social skills.

   It is possible to assess the effectiveness of the Warden's performance measure. For example, they would need to track the boys' progress over a long-term horizon and compare this to the progress of youths at other juvenile camps (where they use different methods to reform the kids). In the short-run, it would seem that the State would want to measure the kids' academic progress (i.e., reading and math skills) so that they are acquiring the necessary tools to be productive upon release.

b. The measure seems to correspond very well with the Warden's objective. This is an extreme case of the Warden using her authority and power to further her own interests at the expense of others.

c. As discussed in part [a], the State could have put in additional performance measures to capture other dimensions of reforming delinquent youth. The State also has to closely monitor the camp and the Warden via surprise visits or formal grievance procedures. Without additional performance measures or monitoring, the Warden is free to do as she pleases.

   Note: The movie *Shawshank Redemption* has a similar theme. In this movie, a prison warden abuses his authority to exploit prison labor and build his fortune.

1.66.

a. All else being equal, the partners in Felipe's firm would like to book the contract as early as possible. Delaying the order until the next fiscal year subjects the firm to uncertainty (albeit small) that the order may be canceled or delayed. As the old adage goes, a bird in the hand is worth two in the bush. Further, the sales shortfall for the year provides additional motivation for the partners to book the sales now and meet targets.

b. The timing of the sale matters a great deal to Felipe. If he books the sale this year, he will have overshot last year's performance by a substantial amount (and he is already over last year's target). More importantly, booking the sale this year will make it that more difficult for Felipe to increase sales next year. Overall, incentive considerations may well spur Felipe to delay the paperwork sufficiently so that the sale counts for the next fiscal year.

c. This act falls in the gray zone of ethical behavior. There is nothing illegal about the action and it is not clear that Felipe's firm will be adversely affected by a few weeks delay in processing the order. Such massaging of last minute orders (oftentimes it works the other way around with managers working hard to pull next year's orders into this year's numbers) is commonplace and unavoidable with budget-based performance measures. Most persons would view this act to be a natural outgrowth of the incentives in place and that it is neither unethical nor unprofessional for Felipe to delay the sale until the next fiscal year.

1.67.

a. Stefan's objectives are clear – he likely will choose the option that maximizes his bonus over the two-year period. Thus, to understand what Stefan likely will do, we should calculate his bonus in two cases: (1) he undertakes the sales campaign; (2) he does not undertake the sales campaign. Notice that we can ignore Stefan's base salary of €15,000 per month as it is the same under both options.

(1) Sales campaign undertaken:

Sales = €22 million this year and €12 million next year.

Stefan's bonus this year = [(€20 million – €10 million) × .02] + [(€22 million – €20 million) × .05] = **€300,000.**

Stefan's bonus next year = [(€12 million – €10 million) × .02] = **€40,000.**

Thus, Stefan's bonus over the two years = **€340,000.**

(2) Sales campaign not undertaken:

Sales = €16 million this year and €16 million next year.

Stefan's bonus this year = [(€16 million – €10 million) × .02] = **€120,000.**

Stefan's bonus next year = [(€16 million – €10 million) × .02] = **€120,000.**

Thus, Stefan's bonus over the two years = **€240,000.**

The net increase in Stefan's bonus from undertaking the campaign = €100,000 = €340,000 – €240,000. Stefan clearly should undertake the sales campaign (time value of money considerations also would suggest adopting the campaign).

b. The firm's objectives also are pretty clear – to maximize value, the parent company likely would want Stefan to pursue the intensive sales campaign only if it increased two-year profit. From the firm's viewpoint, we can calculate the increased benefits and costs associated with the campaign:

Increase in profit	€800,000	(Increase in sales × $0.40)
less: incremental campaign costs	(€1 million)	Given
less: increase in commission to Stefan	(€100,000)	As calculated in part [a]
Net decrease	(€300,000)	

Thus, the sales campaign is not profitable from the firm's viewpoint – accordingly, the firm would prefer that Stefan not undertake the sales campaign.

c. We indeed see that there is a divergence of interest between Stefan and his parent company. This conflict stems from two sources. First, Stefan is not held accountable for costs – Stefan's current compensation arrangement rewards him strictly for increasing revenues – thus, Stefan [theoretically] would undertake any action that increased revenues regardless of the cost to the parent company. For example, Stefan would have an incentive to choose an option that increased sales by €1 million even if it increased overall cost by €2 million. Clearly, there is incentive misalignment and, to rectify this problem, the parent company should hold Stefan accountable for both revenue and costs.

Second, Stefan has clear incentives to manage sales across periods given the structure of his contract – i.e., the higher rate on sales over €20 million and the lower rate on sales under €10 million. The company likely is using this non-linear contract in a belief that it motivates Stefan to work hard. Such contracts, though, may also engender gamesmanship and the company might wish to consider alternative contracts, such as a linear specification.

1.68.

a. The following table provides some key decisions, over the life of the machine, corresponding to the four stages of the planning and control cycle.

Stage	**Detail**
Plan	The decision of whether to buy the new press or not is part of this stage. The act of committing resources, be it money, time or space, is a critical piece of this stage. Other decisions might include choosing the products that will be produced with the new press and the prices at

which these products will be sold.

Implement — Implementation would include decisions about when and where to install the press and how best to schedule production of the various products. This stage also includes control aspects, such as selecting performance targets for the new press (both quantity and quality) and how best to motivate press operators to achieve these performance targets.

Evaluate — This stage would include measuring the quality and quantity of the output and comparing it to the targets established in the implementation stage. Managers at Vulcan would seek to understand the reasons underlying significant deviations between planned and actual results. Managers would evaluate numerous other results, such as repair statistics and operating costs.

Revise — Vulcan's management will continually revise their beliefs about the wisdom of their choice as they gain experience using the press. Eventually, this updated information will influence the type of press they buy next, and might well influence when they buy the next machine. For example, they might decide to scrap the machine in two years if it breaks down more often than is expected.

b. As we see, we usually begin with a plan that is based on a set of assumptions – in this case, the costs and benefits of replacing the current press with a new press. These assumptions are our beliefs about the unknown future. We then implement our choices and, as time passes, we will gather more information about the actual costs and benefits of the new press. Over a period, we will accumulate enough information to revise our original set of assumptions, which will influence our next purchase.

   There are many smaller decisions within this overall cycle. In many instances, the broad loop relating to a decision contains smaller loops within it. For example, we can think of the schedule for any given day as a decision – this has its own loop where we commit machine time and execute the plan. We then figure out whether the schedule indeed worked as planned and the reasons for any deviations. This information feeds into the next day's schedule. The overall efficiency, the outcome of numerous scheduling decisions, then becomes part of the evaluation stage of the larger cycle. The fundamental point is that every decision has a natural cycle to it.

1.69.

Leo's first statement reflects some ignorance about how to make effective decisions. All decisions concern the future. Thus, most decisions include some uncertainty about future costs and benefits. Even what seems to be a simple decision, such as whether to watch a movie a *second time*, contains uncertainty because we do not know how good the movie will be the second time around. Some movies age well while others do not. The point is that we

make decisions with some expectations. As the decision unfolds, we obtain actual results and revise our expectations. This is the planning-control cycle. This cycle does not mean that people must regret or rethink their decisions. It just means that we constantly evaluate where we are relative to our expectations and adjust our plans accordingly.

Leo's second comment is valid. Few decisions cleanly follow the 4-stage PIER process. A complex decision (e.g., who to start, which machine to buy) usually contains many smaller decisions. We can legitimately construct a PIER process for these smaller decisions as well. However, this ability does not remove our need to think about the larger decision as a PIER process. The cycle is a way of showing that every decision follows a common template.

1.70.

The following are among the many items that Tom and Lynda might consider:

1. Increase in number of members. This non-financial item relates to a benefit, increased revenues. The correct benchmark for the item is the number of members if yoga were not offered. The number has to be subjectively estimated. Examining past data on classes offered previously and the resulting membership might prove helpful in forming this estimate.

2. Fee per member. This financial item relates to a benefit. It is easily and objectively measured from the firm's accounting systems.

3. Increase in cost of supplies and other member-related costs. This financial item relates to a cost. Using data from Hercules' managerial accounting system, Tom and Lynda can reasonably estimate this cost. However, there is inevitably some subjective element – e.g., it is not clear whether the gym will have data on the variable costs connected with a yoga class (e.g., number of mats to be replaced each month).

4. Increase in instructor salaries and advertising. This financial item relates to a cost. This item may have to be estimated based on contract negotiations with the yoga instructor. Some amount of this item may also be discretionary (e.g., advertising).

5. Image of the gym. This item relates to a long-term benefit. Offering yoga must fit with Hercules' overall "image" and "brand." For example, yoga might not be the best choice if Hercules primarily catered to men interested in weight lifting and strength training.

1.71.

The following are among the many items that you might consider:

1. Demand for item. This non-financial item relates to a benefit, increased revenues. The number has to be estimated using some objective data and some subjectivity. Examining past data on similar products and market research provide quantitative input that is subjectively converted to an estimated demand.

2. Price for item. This financial item relates to a benefit. It is a choice variable. However, notice that this choice affects demand (and therefore costs).

3. Costs. This financial item relates to a cost. You need to estimate the cost of making and selling the item. Costs would include items such as materials, labor, and commissions, as well as the wear and tear on equipment and warehouses.

4. Capacity. This non-financial item relates to both benefits and costs. This item influences the best price. A setting with limited capacity might push you toward premium pricing while excess capacity might enhance the attractiveness of getting volume with low prices.

5. Effect on other products. Introducing this product might have both planned and unplanned effects on the demands for the firm's other products. The resulting profit impact (which can be a benefit or a cost) often is a crucial consideration in product launch decisions.

MINI-CASES

1.72.

a. To understand Professor Brown's motivation, consider what happens if fewer than 32 students show up and what happens if more than 32 students show up. With too few students, the experiment must be cancelled. In addition to delaying his research, Professor Brown now has the problem of inducing the next set of students to show up. Professor Brown will incur substantial costs in time and effort to reschedule the experiment and recruit new students. On the other hand, consider what happens if too many students show up. In this case, Professor Brown has to pay the show-up fee to the excess students.

Professor Brown's choice of the show up fee amount tries to balance these two costs and minimize their total. To see this, consider what would happen if he offers a show-up fee of $500 and invites 32 students. Not many undergraduate students will pass up a chance to make $500 for sure. If Professor Brown invites 32 students, then he can be fully confident that all 32 will show up. This strategy, however, implies that he will have to pay $16,000 (= $500 per student × 32 students) as a show-up fee. Now suppose Professor Brown offers no show up fee and still invites only 32 students. Then, a student may or may not show up – The student only gives up the chance to spend an hour to make $20 or so. But, if less than 32 students show up, the experiment must be cancelled and re-scheduled. Professor Brown's cost of doing so may be, say, $400 or so. If there is a 90% chance that fewer than 32 students show up, then Professor Brown's expected cost is $400 × 0.9 = $360.

Professor Brown can reduce his expected cost by reducing the probability of having fewer than 32 students show up. He can do this by increasing the number of students invited (still by keeping a $0 show-up fee). However, if he increases the number of students invited, word will soon get out that some (if not many) of the students who show up will go home with nothing for their trouble. Professor Brown may then have difficulty recruiting students for

future experiments. As mentioned earlier, a show-up fee also reduces the probability of having fewer than 32 students show up but is costly to Professor Brown. The $5 fee is a compromise between inviting many students and building up a reputation for wasting students' time and incurring the cost of the show-up fee.

Note: This problem is useful in highlighting how uncertainty shapes our decisions. Realized events lead to actual costs and benefits. However, as we do not know the future, we rely on expectations to compute the value and opportunity cost of decision options (e.g., # of students to invite). Indeed, we could characterize many decisions as finding the best balance between the costs and benefits of alternate future possibilities. Capacity choice is a salient business example that balances the costs of buying too much capacity versus the costs of buying too little.

b. To assess opportunity cost, consider the student's options. The student could show up or not show up. The opportunity cost of showing up is the value of not showing up and doing other things (e.g., watching TV, hanging out with friends, studying). We do not have a good value for this measure. However, if a student does show up, then the student earns $5 for sure. With a 10% probability, the student will be done. S/he can then spend the freed-up time as s/he wishes. With 90% probability, s/he can earn $20 over the next hour. We can combine the two possible outcomes to get an expected value associated with showing up. This expected value must exceed the student's subjective value of not showing up and doing other things. It is not possible to get a quantitative measure of the opportunity cost of showing up.

   Note: The opportunity cost is lower than the expected earnings of $23 (= [.90 × $20] + $5) for the student who does show up, and is likely higher than $23 for the student who does not show up. It is not possible, though, to get a more precise measure of the opportunity cost.

c. Making the students' earnings vary is a mechanism to combat the incongruence in goals between Professor Brown and the students. Professor Brown would like the students to take the decision task seriously so that he can get good quality data to study. The students, on the other hand, would like to exert the least cognitive effort possible, all else being equal. With a flat wage, the student has no incentive to work at the problem and make good decisions. This lack of attention degrades data quality and erodes the value of Professor Brown's study. Linking pay to the quality of decisions (however measured) provides incentives to make good decisions. The student now has to tradeoff the cognitive effort with the expected increase in his/her compensation. Professor Brown will likely structure the pay scheme in a way that students find it beneficial to work hard for that hour.

   Note: One can formally analyze the student's decision task as well. For simplicity, restrict the options to working hard and not working hard. The decision to work hard trades off the cost of effort with the expected increase in take-home pay.

1.73.

a. What does Dr. Cleveland value? The problem suggests three factors: (1) her income, (2) providing quality medical care to her patients, and (3) making her services available to all. All three components are important to her and shape her goals.

Dr. Cleveland's current situation seems to suggest a tradeoff among these factors. The insurance companies allow her to reach out to many people but potentially compromise quality. (We note that there is debate regarding whether the restrictions imposed by insurance companies and HMOs compromise quality. The problem indicates that Dr. Cleveland perceives a compromise; therefore, we assume that quality would increase if Dr. Cleveland were to switch to the patient pays billed charges approach). Additionally, it is unclear how much Dr. Cleveland's income will be affected by her alternatives.

The presence of a tradeoff among the factors that Dr. Cleveland values suggests that her relative preferences among these factors will play an important role. That is, Dr. Cleveland will have to decide which factor she values most – income, quality care, and/or making her services available to all. The choice is not at all clear cut.

b. The following tables provide the required computations:

Item	HMO's and Insurance Plans	Patient Pays Charges Approach
Time per patient (average)	15 minutes	½ hour
Patients per hour	4	2
Number of hours in day	8	8
Patients per day	32	16
Number of days worked	225	225
Office visits per year	7,200	3,600
Revenue per patient	$40	$75
Annual Revenues	**$288,000**	**$270,000**

From a purely monetary perspective, the current approach appears to be more profitable than switching to the patient pays billed charges approach. However, the above comparison ignores any cost effects. It is possible that costs would decrease under a "patient pays charges" approach. First, Dr. Cleveland would be halving the number of patients seen. This reduction in volume could lead to a reduction in the demand for nursing staff as well as a reduction in ancillary help such as receptionists and record clerks. Second, there will be fewer hassles connected with following up with insurance firms, reducing the demand for accounts clerks.

The revenue comparison also leaves out some benefits. Often, clinics conduct many routine tests such as urinalysis. With reasonable assumptions about patient mix, the revenue from these tests depends on the number of patients seen. This revenue would decrease under the proposed plan as well.

Overall, we do not have enough information to estimate fully the monetary impact on Dr. Cleveland's practice from switching plans. (This is the topic of future chapters.)

c. *Goals:* As discussed in part [a], at least three factors impact her goals: (1) income, (2) quality of care provided, and (3) reach of service. It is clear that Dr. Cleveland values all three components. Her preferences will affect the individual weightings. Variations in preferences can lead to differing choices in seemingly similar settings. For example, it is possible that while Dr. Cleveland chooses the patient pays all approach (attaching relatively low weight to reach and money), another physician may choose to stay with the HMOs and insurance firms (attaching relatively low weight to quality of care but higher weights to reach and to monetary factors.)

Options: The opportunity set consists of two options. Dr. Cleveland's first option is to stay with her current practice of contracting with HMOs and insurance plans. Dr. Cleveland's second option is to go with the patient pays all approach.

Technically, one can think of more options. For example, Dr. Cleveland can quit the practice of medicine altogether. Alternatively, she can de-list from some plans and not others. It is likely, however, that Dr. Cleveland would eliminate such options because the aforementioned two options appear to dominate these hybrids. Decision makers often simplify the opportunity set to a few choices, motivated in part by cognitive considerations.

Costs & Benefits: As listed earlier, there are numerous costs and benefits to be considered:

- Impact on income. The two plans will yield different incomes. One is a low-price high volume plan while the other is a high price, low volume plan. In addition, the volume differences may affect overall costs as well.
- Impact on quality. The "patient pays billed charges" approach potentially (at least in Dr. Cleveland's mind) allows her to provide superior medical care. This is an important factor to a committed physician.
- Impact on reach. Dr. Cleveland also believes that good quality medical care should be available to all. She can reach out to the under-privileged and uninsured by, for example, providing free care three days in a week. However, doing so would reduce her income. She seems to have struck a compromise by contracting with many HMOs and insurance plans (this still leaves out the uninsured). Going to a patient pays charges approach would further reduce her reach. Few among us can pay the balance not covered by the insurance payment (we still have to pay the insurance premium). The proposed approach is therefore likely to change her patient profile toward the more well to do. This shift is in direct contrast to one of Dr. Cleveland's core beliefs, and is the crux of the dilemma.

Making a choice: The final step is to pick the option with the highest value – the option that gives Dr. Cleveland the best "balance" between income, quality and reach.

d. The opportunity cost of this decision is the value obtained from the next best use of that time. The problem states that Dr. Cleveland expects to be fully occupied even if she switches to the

patient pays billed charges approach. Thus, if Dr. Cleveland devotes three hours to indigent care, then she gives up the chance to see paying patients. (We are assuming that she is still working for 8 hours per day. The following paragraph relaxes this assumption.) That is, she will see 6 fewer patients during a week. At the rate of $75 per office visit, this translates to $450 per week.

What happens if Dr. Cleveland does indigent care outside her regular office hours (8 hours per day), such as during the early morning and late evening hours? Specifically, assume that she keeps the clinic open from 5 PM to 8 PM on Wednesday evenings, devoting the time only to indigent care. In this case, Dr. Cleveland is giving up leisure time. She could be pursuing other activities (family time, reading, hobbies) during this time. Spending the time on indigent care reduces the time available for these other activities. The opportunity cost is then the value of these other activities. The value of regular patients not seen does not apply here because there would be no reduction in the number of (paying) patients seen.

e. If she devotes only 25 minutes per patient, Dr. Cleveland can see 19 patients per day, or 19 × 225 = 4,275 patients per year. This volume yields revenues of $320,625 (4,275 × $75) per year, a significant increase over the projected revenues of $270,000.

The key tradeoff here is the potential reduction in quality (25 minutes versus 30 minutes per average visit) with the increase in income (patient reach also is affected). The best decision from Dr. Cleveland's perspective is unclear. This change goes against one of her objectives of providing quality care. Her judgment about the quality loss due to the lower time spent with each patient is crucial as she assesses her options. The potential loss in quality along with any associated loss in reputation is a long-term effect. It is likely that only one in many patients feels a significant decline in quality because of the lower time commitment. However, these instances build up over time and lead to the lower overall perception of quality. Good managers consider both immediate and distant effects in their decision making, even if they cannot measure well many of the long-term effects.

1.74.

a. The Directors have five options:

1. Do not fund any project – that is, add the entire $50,000 in remaining grant money to the Foundation's endowment.

2. Fund project A alone.

3. Fund project B alone, and add the remaining $32,000 to the Foundation's endowment.

4. Fund project C alone, and add the remaining $28,000 to the Foundation's endowment.

5. Fund projects B and C, and add the remaining $10,000 to the Foundation's endowment.

With the given budget, it is not possible to fund project A and some other project. This constraint removes the choice of funding Projects A and B (or Projects A and C) from the option set.

In reality, projects can (and often are) funded at less than requested levels. This additional flexibility expands the number of options. For instance, the flexibility permits the option of funding Project A at $35,000 and Project B at $15,000.

b. If project A is funded, then the other two projects cannot be funded. The opportunity cost depends crucially on whether the Directors believe Project B and/or Project C will generate more value than the amount funded.

If both Projects B and C are perceived as valuable (i.e., the Directors believe each project will generate more value than the amount of funding requested) then the opportunity cost is the lost benefit from not funding projects B and C plus the value of adding $10,000 to the endowment.

Suppose project B is deemed to be valuable whereas project C is not. Then, the opportunity cost is the lost benefit from funding project B plus the value of adding $32,000 to the endowment. The opportunity cost is the benefit derived from option 3 in part [a]. (Analogous arguments apply if project C is deemed worthy but project B is not.)

Suppose neither project B nor project C is deemed to be valuable. Then, the opportunity cost is the cost of holding $50,000 in reserve to fund future, yet to be determined, projects. This opportunity cost is the value attached to option 1 in part [a].

c. The approach has benefits and costs. The benefit is that it makes the decision problem manageable. Rather than consider combinations of projects (e.g., projects B and C, project C by itself, project B by itself, and so on), the Directors need evaluate only one project at any given time. This reduces their cognitive load significantly.

The cost is that we may poorly measure opportunity cost. Specifically, because Project C is examined in isolation (without reference to other projects), the approach assumes that the opportunity cost of funding project C is $22,000. It does not consider the other uses for the $22,000 (e.g., that it may be used to fund Projects A or B). In particular, assume that the directors value project C at $25,000. Then, project C will be funded. However, this decision implies that project A will be unfunded, regardless of its merit. For example, project A may be valued at $150,000 – clearly, a better return for the foundation's money relative to funding project C. But, the sequential decision rule leads to a poor decision.

The takeaway point is that the best decision rule should consider all of the options. Restricting the number of options considered, as the sequential rule does, could therefore result in bad decisions.

Note: A sequential decision rule is sub-optimal in this setting because of limited resources. Suppose the foundation had an unlimited budget. Then, it does not matter whether the projects are evaluated sequentially or simultaneously. The opportunity cost of each project in this case is the cost of the funds expended, and not the value of a project that the selected project displaces.

d. Based on the Directors' assessments, Projects B and C should not be funded (because the value is less than the requested amount). The decision boils down to whether Project A should be funded. The opportunity cost of funding Project A is the best other use for the $50,000 (i.e., the value of option 1). This opportunity cost is likely *greater* than $50,000. Retaining the money allows the directors the flexibility of funding a future (but with details currently unknown) project. The value of this should be included in the opportunity cost of funding Project A. Attaching a dollar figure to the value of the flexibility, however, is a difficult task. The Directors have to use their judgment to figure out the chance that a superior project would materialize if Project A were not funded.

   We conjecture that a net value of $500 (= $50,500 – $50,000) is sufficiently small that the Directors will not fund Project A as well.

1.75.

a. For simplicity, let us assume that management's goals are the same as organizational goals. Management then has at least two broad goals. The first goal is to make profit for the shareholders or at least breakeven if the owner is a not-for-profit entity. The second goal is to provide quality medical care to as wide a population base as possible.

   Incentives from a profit maximizing perspective are clear. Profit is a percent of cost, and management therefore will not take any effort to reduce cost. Indeed, given its other goal of providing quality healthcare, costs are likely to explode. (And, they did.) Patients received the highest quality medical care available and no expense was spared.

   Executing this strategy required very little in the form of detailed cost information. However, we note the incentives to 'game' the system. For instance, as different payors had different markups on actual cost, hospital accountants spent time in devising allocation schemes that maximized the hospital's reimbursement. Management accounting took a back seat in the hospital administrators' mind as their focus was to get the latest and best in medical care.

   Note: We note that the patients benefited greatly under this system. However, society as a whole suffered because "too much" healthcare was provided. The PPS system grew out of a desire to rein in the rampant rise in healthcare costs. Unfortunately, healthcare costs have continued to outstrip inflation even into the 21st century.

   We also note that this discussion is an extremely brief, and incomplete, overview of the complex changes that have swept the healthcare system in the USA. Numerous books and journal articles in health economics discuss these changes extensively.

b. Management's goals do not change because the reimbursement system changed. However, the change does affect the actions management considers to meet its goals. For instance, cost control becomes paramount under the PPS system. It is common for hospital administrators today to get detailed cost information on individual procedures and tests. They also set prices and negotiate for DRG rate adjustments based on detailed estimates of the cost of various procedures. Physicians and other medical staff are assessed on their efficiency and utilization rates. The change in the reimbursement system has triggered a major shift from quality medicine at any cost to affordable medicine.

   Note: The rise of Health Maintenance Organizations (HMOs) creates another set of incentives. HMOs, which may also operate hospitals, collect a fixed fee from each member in return for providing all needed healthcare. Under an HMO scheme, the HMO makes profit when its members get sick at lower than expected rates. Thus, HMOs and affiliated hospitals encourage preventive measures much more than during earlier times. Notice that a hospital under a traditional PPS system has little incentive to advocate preventive medicine.

c. The change in the regime affects the information provided to management by changing the nature of the decisions they face. The information during the cost-plus regime likely pertained to the efficacy of the medical care provided, more so than its efficiency. Cost information is accordingly de-emphasized as there is little need to understand and manage cost at the micro level. The PPS system shifts the focus to cost control, meaning that both efficiency and effectiveness attain equal footing. Cost information, detailed down to the individual department, DRG and procedure level, now takes center stage.