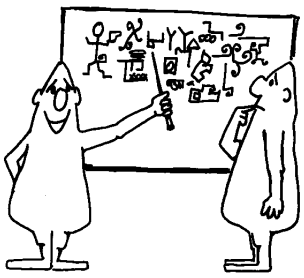

Student Support Materials for

Decision Making and Problem Solving in Management

Tools and Techniques for Managers and Teams

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Chapter 1: The Role of Decision Making in Management

Key points of chapter

This chapter presents an overview of the book and the history of management. It says that making decisions and solving problems is a universal requirement of managers and of people in general. Management is traced from Adam & Eve through Moses to the current time, with the point that even though it's happened throughout history, we didn't start to study it until the late nineteenth century. Participative and team-based management are compared in a very simple form with the old autocratic styles.

Answers to Study Questions

1. All of them
2. (a) Ever since two or more people began to work together on one project. (b) In the late nineteenth century with Fredrick Winslow Taylor.
3. Mentioned by name in this book are Taylor, Fayol, The Hawthorne Studies, and Herzberg. Certainly that's a very short list. Students should be able to do much better based on the readings from their other texts.
4. Besides being asked to use their technical expertise, members of self-managed work teams are also asked to use some management skills.
5. Because through self-managed teams, decentralization, and various other reasons, lower level workers are likely to be more involved in making decisions and solving problems than they have been in the past.

Answer to Exercise

(Individual work – no common answer exists.)

Other Materials

A pre-test of knowledge about decision making (along with answers and explanations) is included in the materials at the end of this guide. Also, that form has space to complete the end of chapter exercise right on it.

Chapter 2: Management Planning and Control

Key points of chapter

This chapter breaks the processes of planning and control into discrete steps. These steps will undoubtedly vary from the way planning and control is presented in the primary textbooks. The differences will be in form, not substance, but you should probably alert the students to the distinctions, and if you use test questions regarding "steps," it needs to be clear to them which set to use in their response.

A six-step process for planning is presented. The first is to establish goals. No distinction is made between goals and objectives, but they need to be specific and measurable. The second step, limits, deals with the resources available to the organization. The third step is developing options (creative),

followed by the fourth step of evaluating (analytical) the options. Fifth is to choose the best, and finally either do it or use the results of step five to establish new, lower level goals and objectives. Various definitions of plans are given, and – again – these may differ in form from the primary texts used for these courses.

A four-step process for control is presented. Establish the standards (which comes out of the organization's goals), then measure performance, compare performance to the standard and evaluate whether they're being met, and finally – if there is a deviation – determine why it exists and how to correct it. Controls of several different types are defined, and both planning and control are related to the other Fayol management functions.

Finally, some other relevant definitions are given, including concepts, models, and inductive vs. deductive.

Answers to Study Questions

1. It is specific, measurable, and serves a valid purpose.
2. Limits include all forms of resources: financial, physical, human, etc.
3. It's difficult to jump back and forth between them. Step 3 is creative, using the right brain and inductive tools; Step 4 is analytical, using the left brain and deductive tools. It's best to do step 3 thoroughly before starting into step 4.
4. Sometimes the result of step 5 in the planning process is still too complex, and must be further subdivided. Recycling, here, means that the manager must return to step one with one or more new, lower level goals to plan.
5. Standards in control of anything come from the objectives and goals which were established in the planning stage.
6. Examples suggested in the book were physical measurements (such as with a micrometer or other tool), counts and reports of output or errors, and general management observation.
7. Staffing, Organizing, and all aspects of management need to be done in response to objectives and measured and controlled accordingly, as well.
8. Concepts provide a structure for analysis; models are simplifications of reality for purposes of explaining or understanding a complex reality.
9. Inductive tools help move from specific to general – such as brainstorming; deductive tools help move from general to specific – such as queuing analysis.

Answers to Exercises

One possible answer among many: Step 1: Decide the goal (We want to have a birthday party for Sherry). Step 2: Define the limits (At least in general terms: When should it happen, who will be invited, how much will we spend on it, etc.). Step 3: Develop options (Next Thursday after work, next Friday at lunch, or Saturday morning). Step 4: Evaluate the options (Good & bad points about each of the choices). Step 5: Choose the best (Friday at lunch). Step 6: Implement (make lunch reservations in the party room of Joe's) or recycle (decide who to invite).

Possible examples: No vegetables which require more than 3 square feet of space per plant. A combination of flowers which will allow colorful cut flower bouquets throughout the season. Etc.

Other Materials

None

Chapter 3: Decision Making and Problem Solving

Key points of chapter

This is the chapter where we really get into the main topics: decision making, problem solving, and the difference between them. Once again, the steps presented are very likely to disagree in form, if not substance, with the primary textbooks.

The chapter begins with three reasons why understanding the processes of decision making and problem solving is helpful to a manager. Decisions come in expected (programmed) and unexpected (non-programmed) forms, but require the same seven steps. The process of planning is simply making decisions for the future, so the steps are similar to those of the planning process.

First, a manager needs to determine if a decision is needed. Several questions are suggested to help make that determination. If one is needed, how important is it, and what limits (resources) apply to it? Then we reach the creative stage of developing possible choices, the data collection stage, the evaluation stage, and finally the decision is made and implemented.

Problem solving is a bit more complex, and is explained in ten steps. Problems exist when either standards are not being met, an inadequate number of options have emerged to make a necessary decision, or problems arise independent of the planning or control process.

The problem solving process begins with stating the facts and determining that you have identified the real problem, then listing and evaluating possible causes to determine the most likely cause. Once that has been done, possible solutions are listed and evaluated. The best solution is selected, tested, and applied. This really requires two creative and two analytical stages.

Answers to Study Questions

1. It can give the decision maker confidence, provide a process, and assist in the gathering and development of necessary information in the most efficient manner.
2. See box on page# __.
3. See box on page# __.
4. How much does it cost? How long is the commitment? Who else is involved? Can it be changed? Etc. All of these questions will lead to an understanding of the decision's or problem's importance.
5. When standards aren't being met according to plan, when unexpected opportunities or challenges emerge outside of the plans that were made, and when an inadequate number of choices has developed to make a good decision.
6. Many problems are obscured by superfluous information, and effects often masquerade as causes. Putting it into writing and testing the accuracy of the statements written down will help to clearly specify the right problem.

Answer to Exercise

(Individual work – no common answer exists.)

Chapter 4: Creating Possibilities

Key points of chapter

This chapter covers the creativity (right brained) portion of the decision making and problem solving process. James L. Adams' book titled *Conceptual Blockbusting* is summarized in a couple of pages. Adams says there are six broad categories of things which block creativity. Emotional blocks include such things as fear of making mistakes and a need for security. Perceptual blocks exist when individuals don't perceive what they expected or don't look at things the same way as others. Cultural blocks occur when traditions and taboos get in the way of creativity. Environmental blocks come from problems created by bureaucracy, co-workers, and so on. Intellectual blocks occur when people don't have adequate information or understanding to be creative, and Expressive blocks exist when people have ideas, but aren't sure how to explain them.

Barriers to creativity can be overcome by intentionally changing an organization's climate or an individual's attitude as they relate to creativity. Being creative can be occur when people understanding and practicing certain techniques and tools which encourage creativity. Creativity is essential to both problem solving and decision making.

Answers to Study Questions

1. Emotional, environmental, perceptual, intellectual, cultural & expressive.
2. While they may originate from the same causes, values are more deeply ingrained than attitudes, thus more difficult for an individual to change.
3. Practice, exposure to new and creative situations, classes, puzzles and brainteasers, competition, healthy habits, use of tools of various kinds.
4. True.
5. (a) Establishing goals; developing options: Steps 1 & 3. (b) Steps 1, 3 & 4.

Answers to Exercises

B ~~S~~ **A** ~~I~~ **N** ~~XLE~~ **A** ~~T~~ **N** ~~TE~~ **A** ~~RS~~ Crossing out SIX LETTERS leaves BANANA.

26 = Letters of the Alphabet	1001 = Arabian Nights
3 = Blind Mice (See how they run)	1 = Wheel on a unicycle
7 = Wonders of the Ancient World	13 = Stars on the American Flag
11 = Players on a football team	12 = Signs of the Zodiac
18 = Holes on a golf course	

The paragraph does not use the most common letter: "e."

(Individual work – no common answer exists.)

Chapter 9: Creativity Tools

Key points of chapter

This is the second of the four tools chapters. See comments in the foreword to the book. Tools included are: several variations of brainstorming, several variations of cause effect analysis, checklists, attribute listing, morphological analysis, catalog technique, artificial intelligence, and several others.

Answers to Study Questions

1. See pages #___.

2. See pages# ___. Also, handouts are included with more detail about Delphi.
3. See pages# ___.
4. They both depend on finding good checklists and catalogs. If you can't find good ones, the technique can't work.
5. Attribute listing forces separations, where morphological analysis forces combinations.
6. Mainly, it requires a computer (other tools don't). Actually the Decision Tables (see handouts) is kind of a manual form of artificial intelligence.

Answer to Exercise

Problem #	Probably Works	Probably Doesn't Work
1	C D G	A B E F
2	A B C D G	E F
3	A B C D E F G	
4	D E F	A B C G
5	A C D E	B F G

Other Materials

Several handouts and transparencies in the back relate to this chapter. I have a now about six year old AI/Expert system program I created which can be demonstrated (need computer projector and must go into DOS mode, but it's fairly user friendly). I can also share with you how I use a segment from *The Neverending Story* video for a guided fantasy. A handout on *Delphi* is included, and I have some overhead transparencies available if you want to tackle describing it in an exercise or during class.

Chapter 5: Gathering Information and Analyzing Possibilities

Key points of chapter

This chapter has some very basic statistics concepts in it, and has been know to cause mass hypnosis of a classroom unless presented fairly lightly in a disarming way.

Begin with emphasizing the need for collecting the right data, and not too much or too little of it to make the decision or solve the problem. Pareto Analysis is a way of helping people understand that there's lots of detail out there, but most of it is unimportant. The difference between a known and unknown universe of samples is mentioned, and the basic concept of probability is introduced using cards, dice, and other simple ideas. The term gambler's fallacy is defined (most seem to miss the point of this on a test, by the way), as is the concept of risk-aversive ness. A brief introduction to stratification and data samples is given, but they certainly won't be ready to work for Harris or J.D.Powers Polls. Correlation, minus the formula, is discussed. I didn't even give the formula in the mathematical appendix, since no one does it by hand anymore unless the teacher is totally sadistic.

Answers to Study Questions

1. See page# ___.

2. Make a list of the categories of data which could be collected, then arrange them in order starting with most useful. Start collecting the first (practical) one on that list. When you have enough data or run out of money and time to collect more, stop.
3. Known.
4. Personality, resources available, peer pressure, extent of inebriation, etc.
5. Dividing up information in a useful and representative fashion. Insuring that a sample population is composed of appropriate combinations of sub-groups in order to accurately represent the true population being studied.
6. Correlated.
7. It's predictably accurate (when done properly) and far less expensive and time consuming than doing a 100% study.

Answers to Exercises

Are you sweating yet?

Primary sources would include your customers, suppliers and employees. Secondary sources would be all sorts of market and government information including such things as cost of living, tax rates, airport data, and so on. The "Places Rated Almanac" is an example of a market data resource. Each student might be asked to list things appropriate to his or her job.

Example: Collect (anonymously, of course) the height in inches and weight in pounds of each person in the class. Are height and weight correlated? If you have a business calculator, you can actually test for the correlation coefficient. I did this for a past class and came up with a correlation of +0.41 and a regression equation of W = -140 + 4.4 H. Any topic will do, of course.

Other Materials

None

Chapter 7: Proposing Changes

To be added

Chapter 8: Tools for Planning and Control

Key points of chapter

This is the first of the four "tools" chapters as explained starting at the bottom of page *v* in the foreword of the text. It includes step by step directions for four tools: Gantt Charts, PERT Charts, Control Charts and Budgets.

Answers to Study Questions

1. Budgets is the best answer, though control charts could be set up for such a purpose, and there are programs for PERT-Cost, as well (but not discussed in this book).
2. All four of them have some time basis.
3. The more complex the project, the more likely PERT will provide benefits over a traditional Gantt chart.

4. By allowing visual projection or extrapolation of trends indicated.
5. While financial is usually the first thing that comes to mind, many physical types of resources also can be budgeted.
6. The Ravens.

Answers to Exercises

(Individual work – no common answer exists.)

Other Materials

I have some overhead color transparencies to demonstrate a Gantt and a PERT chart. Also, masters of a handout of a PERT exercise are included in this booklet.

Chapter 10: Tools to Compare and Evaluate Options

Key points of chapter

Another tools chapter.

Answers to Study Questions

1. When the criteria being evaluated are of unequal importance or value to the decision.
2. The numbers in each cell have a realistic, not simply a relative or scalar value.
3. Of course. The text examples all have three, but any number is possible.
4. Only by accident. Generally, the answer is "no."
5. Probably like a skewed-to-the-right product life cycle.
6. Yes. It's almost imperative unless your demand is flat and predictable.

Answers to Exercises

Individual exercise - no common answer.

Possible answer: Top Box (Student: 100%); 2nd row: (Reading: 30%, Class: 25%, Study & homework exercises 45%); 3rd row breaks out class into lecture, exercises, tests; etc.

Cost of the instructor, overhead assigned to each class (registration cost, room space amortization, etc.), use of supplies (such as paper for handouts, markers, etc.), state subsidy, tuition and fees (in- and out-of-county) paid by students).

Other Materials

Decision Matrices are probably the most versatile. I even tell my classes I found one of my sons many years ago using this technique to decide which girl to ask to the senior prom. I refuse to divulge the criteria. Queuing takes up the most space, but as long as they get the concept of what queuing is, I really wouldn't expect anyone to do it manually. This chapter has lots of limited use stuff, such as EOQ, but note the diagram on page# ___ which shows that even EOQ can be applied to a different way of

thinking. Pick and choose what tools you're comfortable with and want to assign. Make sure people have a chance to practice it, since just discussing this stuff won't work.

Chapter 11: Tools to Determine Operational Productivity

Key points of chapter

Another tools chapter, this one focused on industrial engineering type tools.

Answers to Study Questions

1. Operations Auditing works when there's good documentation of a job (such as clerical or piecework types), and where precision is not a big deal. Work Sampling requires a visible activity with enough volume (number of employees) doing it to justify the cost of the study. Flow Process Charts require a job that's done consistently and frequently enough to justify the study cost.
2. Workers often have trouble coming up with realistic times and frequencies; the process is somewhat intrusive; it's subject to biases; it measures what is done, not necessarily what should be done or whether it's being done effectively.
3. Difficulties in distinguishing among tasks; it's intrusive; cost and length of time (usually at least ten days required); needs adjustment for cycles; etc.

Answer to Exercise

Individual project; no common answer.

Other Materials

A blank form for Flow Process Charting is included in the materials. It can be reproduced if students want to give the technique a try.

Chapter 6: Other Considerations in Decision Making

Key points of chapter

This chapter covers the psychology and sociology of decision making. It's a mile wide and only a couple inches deep. Students who have had BUSM 2200 (Organizational Behavior) or other courses which deal with group dynamics will have covered some of the main ideas.

The most important idea in the chapter has to do with when to use or not use groups to help in decision making and problem solving. There are some other points, such as critical thinking and organization culture, but probably focus on the group decision ideas.

Answers to Study Questions

1. The only tool among the 22 which absolutely requires groups is Brainstorming (#5). Many of the others, of course, might be better used by groups than individuals.
2. See pages# ___.

3. See pages.
4. See pages.
5. See page.
6. See pages.
7. Theory provides a structure and process to help in making decisions properly, effectively and efficiently.

Answer to Exercise

Individual question; no common answer.

Other Materials

Remind students of what they've learned from other courses (and the other textbooks used in the present courses). Group dynamics, organizational culture, critical thinking, and even more limited concepts like framing require a lot of time and experience to understand. We're limited - largely - to academic treatments and experiments in our discussion of these.

Attachment: Handouts & Transparency Masters

Note: "OH" = Overhead Transparency Master

Pretest *
Decision Making Worksheets (3 page set)
PERT Chart Exercise (2 pages + solution on 3rd page)
Is a decision needed? (OH)
How important is the decision? (OH)
Problem Solving vs. Decision Making (OH and handout)
Creativity Puzzle (OH) *
Additional Creativity Exercise (OH)
Sample fishbone diagram (OH)
Sample decision tree (OH & Handout)
Example Cause-Effect Matrix (OH)
Pareto Analysis (OH)
Delphi Example (2 page handout) **
Expert Systems (2 page handout)
Lost at Sea Exercise + answers
Decision Tables (4 page handout) **
Flow Process Chart (Handout of blank)
Kepner-Tregoe Model

* I have answers for these, if anyone wants them.
** I also have transparency masters to support these, if anyone wants them.

Additional Creativity Exercises

Add one line to this and turn it into 6.

IX

What is the ordering of these numbers?

8, 5, 4, 9, 1, 7, 6, 3, 2, 0

What is the next letter in the sequence?

O T T F F S

What is different between the following two groups?

A E F H I B C D G J

Answers: Add "S" ; Alphabetical ; S (seven) ; All straight vs. all curved.