

1.4.2.7. INFORMATION PORTRAYAL WITH A PURPOSE—FRANCISCO DE GOYA

1. BACKGROUND

1.4. THEORY

1.4.2. A MANAGEMENT SYSTEM

1.4.2.8. THE INTERFACES

1.4.2.8.1. WE MATCH THE INTERFACES TO GET BALANCE.

You'll focus on the three interfaces between pairs of components of the Management System Model so you can diagnose and fix problems of mismatch that lead to internally-caused crises.

I need to dedicate more time to keeping my calendar and to-do list so I can act rather than react. I want a working, useful information system and I must figure out what to tell someone to do to fix or replace the one I have. My decisions ought to be leading to meaningful actions. I should start measuring the right things, because I really don't use all the data I have. I must determine what isn't getting done and find a way to reflect back to my people our performance and what we need to do to the process to improve. I need to put my finger on what is really going on here. Have you ever heard, said, or thought thoughts like these?

If the components of the Management System Model (MSM) were balanced and if your management tools fit your domain of responsibility properly, you'd be thinking about how to improve your management system rather than how to catch up to it. Figure 1.1.21.3., which shows the MSM, highlights the very spots you need to concentrate on to make this happen—the interfaces between the MSM components.

The three essential components are balanced by the interfaces between them. Who manages makes decisions based on useful or preferable information. Converting information to action through these decisions is the crux of management (the decision/action interface). Through measurements to assess performance, data are generated that represent characteristics of what is managed (the measurement/data interface). Information results from biasing data and is portrayed in one of four portrayal formats (1) a table—least biased, 2) a graphic—a pictorial representation with a math equation of symbols is least biased graphic, 3)

check list, and 4) text—the most biased and richest); and who manages perceives information based on his or her individual characteristics (the information-perception/information-portrayal interface).

The words information and data are often used interchangeably. As I stressed in Module 1.1.16.10., I choose to make distinct differences to illustrate the difference between what Blumenthal calls "an uninterrupted raw statement of fact"—data—and "data recorded, classified, organized, related or interpreted within context to convey measuring"—information. This interpretation with context is bias and makes information less pure but more useful and powerful than data. (p. 30.)

For balance, our management tools must accurately reflect what is managed. If our operation is budgeted by both budget structure and geographic distribution, spreadsheets by budget structure alone will not do the job. If our operation provides customer-oriented goods or services, a technical-function oriented organization structure will work against us. Our management tools must be acceptable (comfortable and useful) to who manages. If the manager is systematic and prefers definition and detail, the most modern, colorful graphics output package will not be liked or used. If the manager is young and inexperienced, a highly sophisticated financial plan will overwhelm him or her.

An effective information portrayal/information perception interface helps you get your tools, including your information system and long-range plan, to do what you want. You get

the right data by concentrating on measuring the right performance variables. Informed decisions addressing the tangible, physical need of your operation will lead to actions that affect your operation. At each interface, you must match up the components involved. The problem is most puzzling for more-uncertain pursuits, global endeavors, and unstructured decisions. Remember, as shown in Figure 1.4.2.8.1., while no one piece completes a puzzle, all necessary pieces must be in proper relation to their neighbors.

For better or for worse, your management tools will make the difference in achieving a balanced management system through the interfaces. These tools contribute directly to two

of the interfaces and heavily influence the third. Since the who manages is the one who all this is addressed to and who must ultimately carry through with the balancing act, I'll begin with the interface between you and your tools. Then I'll proceed to the other interface directly involving you—the decision/action interface. The who manages is anyone who uses information (through the first interface) to make decisions that lead to actions (through the second interface) affecting the operation, for comparison to evaluate the effect of the decision (through the third interface). The third interface (the measurement/data interface) is between your operation and your management tools.

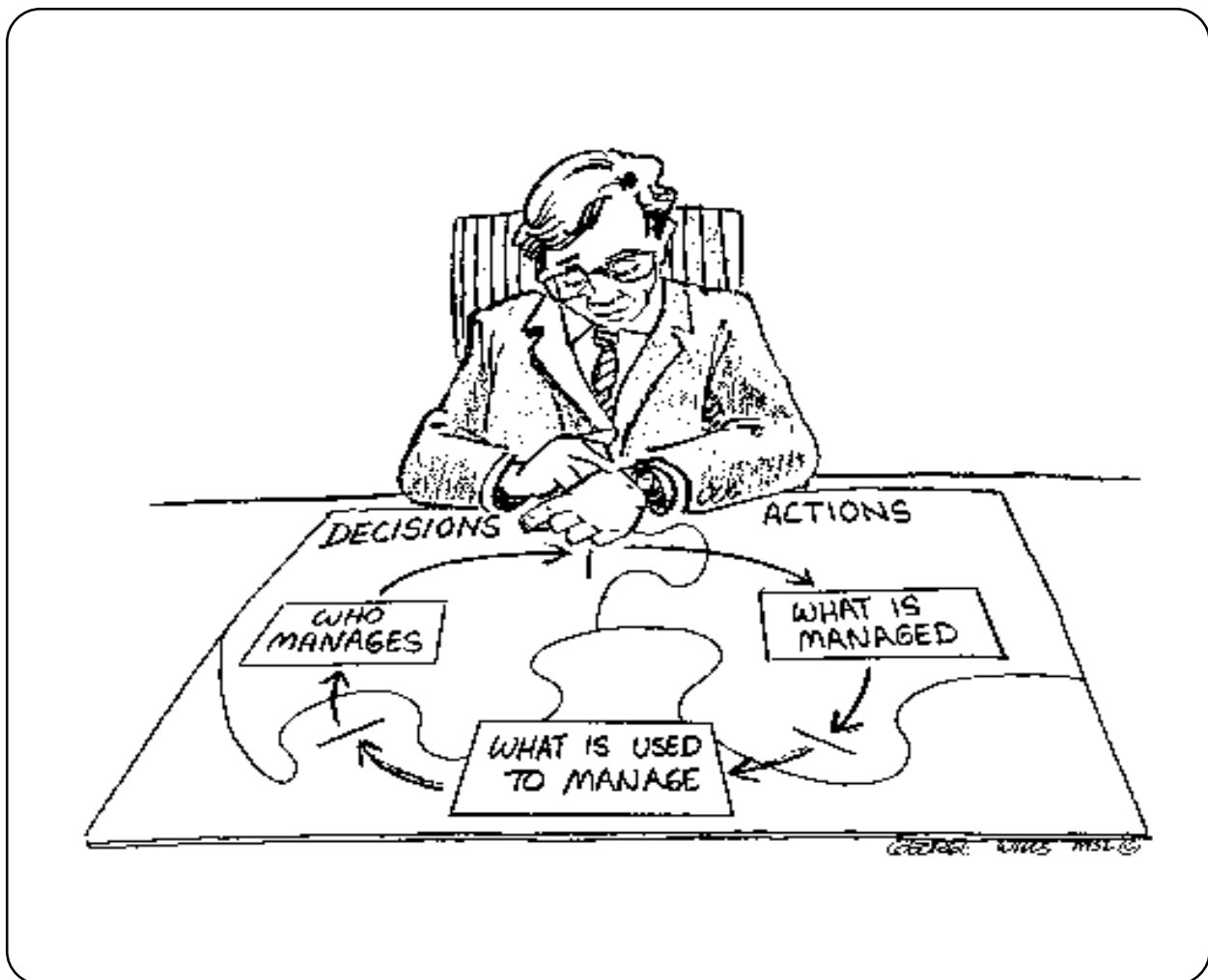


Figure 1.4.2.8.1. *The pieces fit at the interfaces.*

1.4.2.8.2. THE INFORMATION PORTRAYAL/INFORMATION PERCEPTION INTERFACE

You must portray information to best suit the objective and the data available and must portray information the way the who manages wants to perceive the information.

The information portrayal/information perception interface both is the most neglected of the three interfaces and is the most important. This interface is difficult to deal with because of the ill-defined and changeable human factors involved.

An important issue is if or when to develop a new management tool. Why not develop another software package, reorganize, or write a new plan? We can develop these tools and can show something for our efforts. The tool will be functionally better, but will the user, or decision maker, like the new tool better and therefore use the tool?

We have to work hard to show any significant improvement at the information portrayal/information perception interface. All management tools should present information to the manager. Although we generally review plans, information systems, and communications, in the end they all have the requirement of portraying information in a useful way for a human being.

How do you perceive the output of your management tools? Are you comfortable with the information you get? Would you prefer something else if you just knew what it was you wanted? To help you deal with these questions, I'll begin with an exercise for you to do in your mind. I intend for this exercise to persuade you that information is biased and most information is confusing because of hidden agendas, too many conclusions in a single presentation, and a misinterpretation of who should bias the information.

Drawing Conclusions from Data

To begin the exercise, look at the budget table in Figure 1.4.2.8.2.1. and draw a conclusion about the XYZ Program based on the data in the table. Tables are the least biased of all information portrayal formats, so your conclusion will be based on the purest possible representation of the facts. You may draw a conclusion based on all the data or any conclusion based on a subset of the data. Take a second and write down a sentence stating your conclusion and then summarize your conclusion in a short sentence of ten words or less. (To see the outcome of this exercise, you must state your conclusion as a complete thought with subject, verb, and object). Don't use the sentence I have for the title of the chart in Figure 1.4.2.8.2.1. I'll bet I've biased your thinking with my title.

Now have one or more of the people in your family or office do the same thing without knowing what you're thinking or what you wrote. The first of several surprises I expect for you resulting from this exercise is that you'll find the conclusions drawn are different. I've had hundreds of workshop attendees do this exercise and as yet haven't had one group in which there were two identical conclusions (sentences). Some were close, most were radically different.

You and those who participated have shown biases through different education, experiences, cognitive styles, and perhaps other human characteristics.

Representing Your Conclusions in Graphic Form

Now, to continue the exercise, you should draw how you believe you could most effectively represent in a graphic form your conclusion from the table in Figure 1.4.2.8.2.1 so anyone who sees your graphic will come to identically the same conclusion you did. Don't feel limited by the available choices for graphics. If you're artistic, you can even make an illustration. Otherwise, you might prefer a line graph, bar chart (vertical or horizontal), stacked bar chart, surface chart, pie chart, or one of many others. Write down (or at least think about) the title you'd use for the graphic. I believe you'll discover two more surprises from this part of the exercise.

The first surprise is that one graphic format will work best in presenting the conclusion you chose. You may not have selected the best one. Just using bar graphs because the computer package does that easiest or first is a mistake. If your conclusion alluded to a trend, a line graph works best. If you saw comparisons between components or comparisons of the components against their total, a bar chart or a pie chart works best, respectively.

Other Information Portrayal Formats

The choice of information portrayal format can be an extremely logical process based on the structure, type, and amount of data and the conclusion you wish to communicate. I've developed a procedure of designing effective graphics through a structured set of logic diagrams. I'll show you that tool soon. While graphics can be a concise way to communicate information in a book, paper, report, briefing, management information document, or any other management tool presentation, they can also be confusing or misleading when not properly designed.

The increased availability of computer-generated graphics has led to a proliferation of

charts and graphs. Graphics should simplify, not confuse. They must focus, not distract.

In my logic diagram procedure, I add to graphics three other information portrayal formats. The four choices for portraying information are table, graphic, checklist, and text listed in order of ascending degree of bias and descending level of detail.

The table shows bias through title, column and row choices, and entry precision. The graphic is biased in kinds of comparison, scale, and visual presentation and enhancement. The checklist (government forms or tickler files, for example) reflects arrangement and word choice and amount of attention. The text provides great flexibility in presenting ideas, degrees, and justification.

Your second surprise is that the title for your graphic should be the short sentence of less than ten words you developed. Since the graphic drives home your conclusion (bias), to be "up-front," the audience should be able to determine instantly what that bias or conclusion is. (You may want to be obtuse or to confuse, but you only want to do that on purpose.) Not everyone would have chosen the same conclusion, and the audience needs to know what he or she is being driven toward.

The Problem with Multiple Conclusions

Don't try to bring the audience to two or more conclusions from the same graphic. He or she will receive mixed messages and won't come to any of the conclusions. Show one conclusion at a time, and everything on the graphic should support that conclusion. For example, two pie charts on one graphic are used together to make one conclusion, not two. The two graphics in Figure 1.4.2.8.2.2. present the exact same monthly research expenditure for the 1985 calendar year for my organization. However, I've chosen two different conclusions and used the graphic format which best makes that conclusion. You should choose the conclusion, and

therefore the chart, to meet your needs.

If you attend one of my seminars, briefings, or workshops, you'll find that every briefing chart is titled with a sentence (including the period). Whether you read the title to yourself or I read it aloud, you'll know exactly what I want you to conclude from my briefing of that chart. I call the approach "the Perry Method" after the person who teaches developing briefing charts that way. I've extrapolated the idea not just to information presentations using briefing charts, but all information presentations: titles for tables and graphs, titles of reports or major headings therein. Preparing a briefing using the Perry Method is difficult; presenting that briefing is easy.

You may put a briefing together by listing chart titles as introduction, summary, results, expenditures, personnel, and so on. Then you take all the points you want to make and put them as bullets on the chart in which they seem to fit best. Now look at what you've done. One or more bullets don't develop the same conclusion as the others, and the audience is confused. With a conclusion for a title, a given bullet either helps make that conclusion, or it is on the wrong chart, a new chart is needed because the idea the bullet makes is important, or the bullet doesn't really help and should be

discarded. The conclusion as a sentence must say something. The title "I'm taking four actions." doesn't count. The title "Four actions will get us out of debt." does.

Bias

An important idea not to forget is: Since, information is biased, whose bias should it be? Yours, the manager. Now you must worry that when you make decisions based on information presented to you, if you didn't dictate the bias and the person bringing you the information is good, you'll naturally come to his or her conclusion and probably make the decision he or she would. Who's running this railroad, anyway?

As the decision maker, the consequence of not providing a bias to the person who'll make information out of gathered data to present to you is you'll make your decision based on his or her bias. The more bias you establish for the information gatherer, the less bias available for the information gatherer to interject. Therefore, as decision maker, tell the information gatherer the information you want. For example, tell the information gatherer you want a list of all milestones listed in the strategic plan that are more than ten days late. Don't tell the information gatherer to give you information on milestone problems.

PRIORITIES WILL CHANGE IN A CONSTANT PROGRAM.

XYZ PROGRAM FOUR-YEAR BUDGET

(Dollars, in thousands)

PROGRAM ACTIVITIES	FY95	FY96	FY97	FY98	TOTAL
Plant Operations	50	60	70	80	260
Steam Generator R&D	10	10	10	10	40
Recycle Processing	10	40	15	10	75
New Processing Facility	15	5	5	15	40
Laser Technology R&D	30	0	15	0	45
TOTAL PROGRAM	115	115	115	115	460

Figure 1.4.2.8.2.1. A fiscal budget table shows little bias.

YOU CAN DRAW DIFFERENT CONCLUSIONS FROM THE SAME DATA.

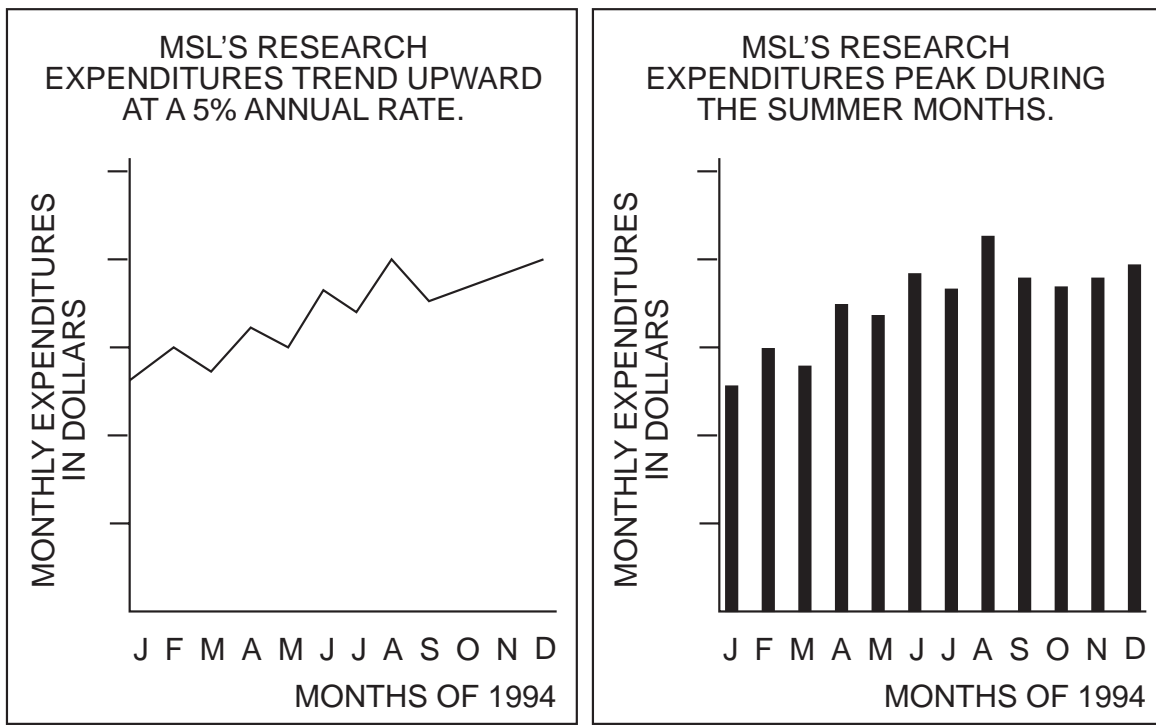


Figure 1.4.2.8.2.2. Your conclusion is expressed as a sentence in the title.

1.4.2.8.3. INFORMATION AND NOISE

“Information informs, but noise annoys.” (Louis I. Middleman, *In Short*, p. 40.)

A dangerous problem is information overload. The great quantities of information that many managers are forced to consider become even more of a concern when we introduce the dramatic findings of cognitive psychologists that subjects in a situation of information overload use less information in decision-making than do those with some near-optimal amount of information. In other words, more information is not necessarily better. We believe that our short-term memory has a limited capacity—about seven “chunks” of information.

In module 1.1.16.10., I distinguished between data and information. Now I must distinguish information from noise.

Consider the situation in Figure 1.4.2.8.3. In my class, there is an intermitting fluorescent fixture. During class, it makes noise and interferes with my lecturing. But when someone comes into my class to fix it, the first thing he will do is tell us all to be quiet, because now the sound from the fixture is information and the class is noise. The conclusion is that nothing is absolutely information or noise, but becomes one or the other in response to a question (bias). The purpose of the system (unit of interest) determines what’s noise and what’s information.

Information overload is a misnomer because what we call information overload is really a high ratio of either noise or unprocessed data.

Engineers deal with situations where the ratio of signal to noise is relatively high. When we deal with inanimate objects or machines, we can predict cause-and-effect relationships based on our understanding of the laws of

nature. Relatively speaking, inanimate objects are predictable. Using Deming’s definition of management as prediction, inanimate objects are relatively easy to manage. When we are supervisors and work with people the ratio of signal to noise reverses. The noise is quite high. We haven’t learned how to apply the laws of nature very well to people and especially to people interacting in groups. When you’re in a sea of noise, the ability to pick the information out of the noise becomes crucial.

You can be overloaded with noise, data, or information. If we have to be overloaded with something, we’d prefer the something be information. However, information overload is a frustrating and counterproductive experience. Our job is to identify and try to separate (if we can’t eliminate) noise, to use only the data necessary to make the information we need, and to only deal with the information we need to make the decisions we have to make.

Some people prefer more information than other people. So, information overload is a function of the person making the decision. In fact, some people prefer detailed information, or even data. These people either like details or they want to be positive the bias in the information they use is their own.

As builders of management tools, we must understand the characteristics of the decision maker in terms of the noise, data, and information they prefer. We can’t always give the decision maker what he or she wants in terms of noise; but if we don’t know the decision maker’s needs and preferences and the characteristics of the operation, we can’t even do our best.

Lou Middleman tells me that Ernest Hemingway spoke of an author's need for a built-in, fool-proof crap detector. That's exactly what a decision maker needs. A detector

that can surface bias and filter out noise, leaving behind pure information to support decisions.

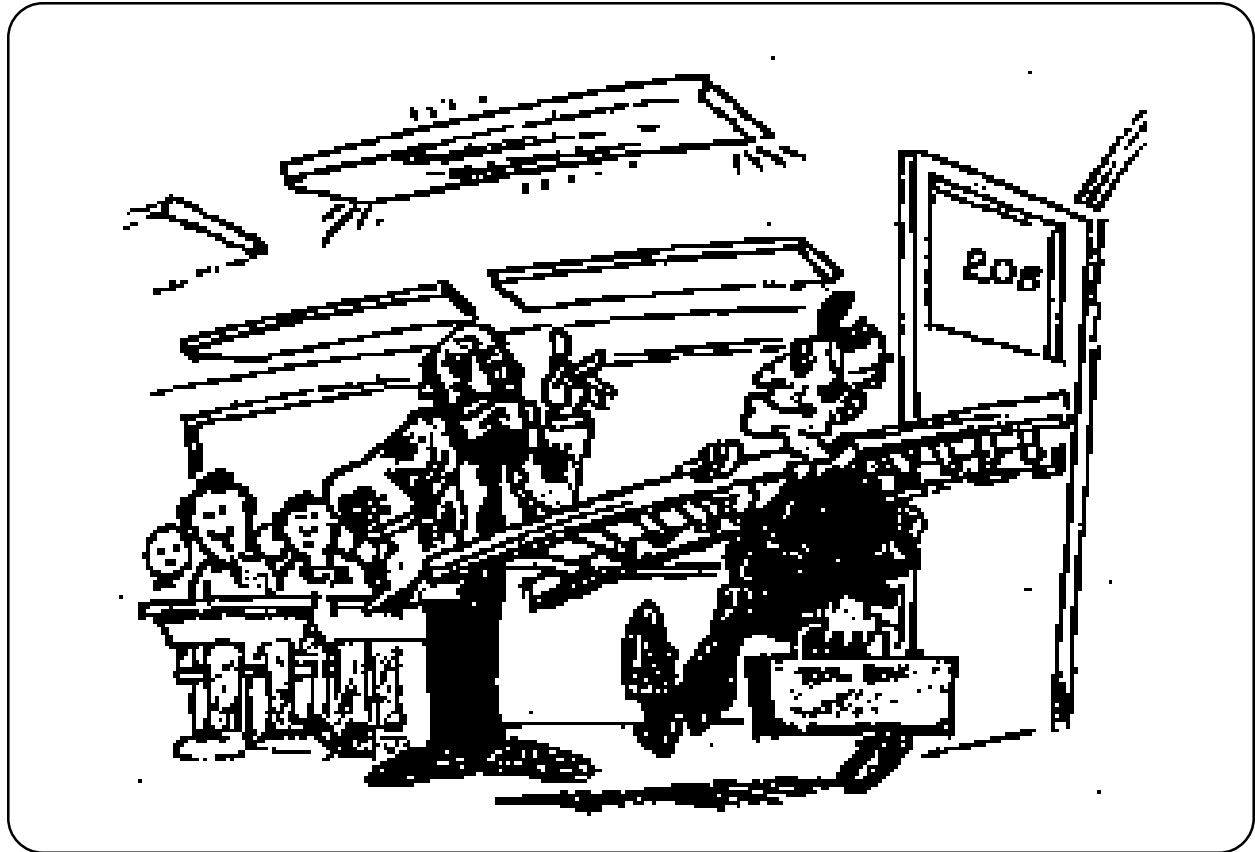


Figure 1.4.2.8.3. *“Can’t you tell? That’s the one.”*

1.4.2.8.4. APPROACHING AN INTERFACE FROM ITS TWO SIDES

Matching the two sides of one of the Management System Model's interfaces isn't easy because each side is affected by the closest component.

In Module 1.4.2.8.2., I used the exercise of drawing a conclusion and preparing a graphic based on a tabular format to lead you through the interface from information portrayal toward information perception or in the direction that is the specialty of the information specialist. However, regardless of the structure and quantity of data and the desired conclusion to be presented, some of you will prefer to work with the tables (perhaps a simple table highlighting just the conclusion) and some will prefer the graphics.

I'm leading you now to the left-brain, right-brain discussion and I'll choose to call the preference for structure and detail that we see in specialists systematic, or sensing, and the preference for bottom lines and trends that we see in generalists intuitive. Your position and your task can shift your information processing style toward systematic or intuitive but you prefer one or the other. I'm now leading you through the interface from information perception toward information portrayal or in the direction that is the specialty of a human factors specialist.

To make a match at the interface and have it contribute to balancing the components of the Management System Model (MSM), both directions must be considered because the interface is not a finite line but rather a continuum. For the information portrayal/information perception interface, the continuum contains some of the management tools and some of the human decision maker. As a manager you have a unique combination of experience, education, and cognitive style with your more human traits. These will influence how you perceive information. The immediate effect

on the design of management tools isn't clear, but the effect on the use of the tools is. A.P. Sage argues "... it is necessary to incorporate not only problem characteristics, but also problem solver or decision maker characteristics, into the design of information systems for planning and decision support." (Andrew P. Sage, *Behavioral and Organizational Considerations in the Design of Information Systems and Processes for Planning and Decision Support*, IEEE Transactions on systems, Man, and Cybernetics, Vol SMC-11, No. 9, September 1981.) G.P. Huber argues that, "... we do not know if DSS designs should (1) conform to the user's cognitive style or (2) complement the user's cognitive style." (George P. Huber, *Cognitive Style as a Basis for MIS and DSS Designs: Much Ado about Nothing?*, Management Science, Vol 29, No 5, May 1983, p. 571.) Note that DSS stands for decision support system.

I believe the direction of considerations about designing management tools to fit the cognitive preferences of different users should be toward the idea of responsive systems, or systems that can adapt to different users, which I'll describe later. Huber further says, "... the DSS design effort should be directed toward creating a DSS that is flexible, friendly, and that provides a variety of options. If this focus is adopted, the matter of an *a priori* determination of the user's style *as a basis for identifying the most appropriate design* becomes largely irrelevant." (p. 575.)

Regardless of the design of our management tools, within the context of the MSM and matching the interface, the human differences between managers must be considered. In

short, a manager who doesn't like a particular tool generally won't use it and will develop ad hoc methods of getting the information he or she wants. People with different cognitive styles prefer information presented in formats that reflect those styles. Managers and management tool designers must recognize the issue and plan for preference and deal with possible failure when the who manages component changes.

Most of the time you have data from measurements that are best suited to a given portrayal format. I'll describe the rules for choosing the best portrayal format for a given use of the data and for a given set of data later. For now, realize that, without considering the who manages, we can logically derive a most effective portrayal format. What do you do when the so-called best portrayal format isn't what the who manages likes? Many information coordinators will befriend the data and information and insist on the format best for the information. Then the decision maker won't like what he or she gets and won't use the information. The information portrayal/information perception interface breaks down. There is no match.

The dilemma we face as we build management tools is that very often what is best for one side of an interface isn't best for the other side. This dilemma is a case of the typical engineering problem. Of all the conflicting options, which do you choose? In a case like this, there is no perfect answer. You have to make the best match you can. You have to choose the best portrayal formats *given the constraints of the manager's needs and desires*.

Proctor and Gamble isn't known for its managers using graphical information formats and graphics packages on the computer. (personal communication, Laurie Laning) I believe the rigorous selection process of Proctor and Gamble, which includes testing of applicants, filters managers who are more systematic and

wouldn't prefer graphics.

Why do you choose the formats you do? If you believe the choice is because your favorite formats are better, you may be trying to turn a subjective feeling into an objective fact. Guess which person finding his way out of the woods in Figure 1.4.2.8.4. is systematic and which is intuitive. Which would you be?

I'm an intuitive person and like examples and illustrations. The illustrations in this book and to some extent all the figures are for people like me. For us, the illustrations and figures make the points of information clearer and more meaningful. Most managers in my workshops agree. Some, and those who are typically systematic, feel my illustrations aren't helpful. In fact, for some people, the figures are a bore at best and confusing at worst. For them, I not only have to make the point in the illustration but have to carefully explain the connection between the illustration and the point of information the illustration supports.

I've made a terrible mistake in some of the oral presentations I've given. At one time, I assumed that for all audiences the illustrations would require less explanation and time to cover than would the typical briefing charts with written phrases. I felt the illustrations would reinforce the point in the briefing chart containing words and would save time over the entire oral presentation. What I learned was that for a sensing audience, I need to spend more time on illustrations (or not use them); and, if I don't, the presentation fails.

Does the point I'm making in Figure 1.4.2.8.4. jump out at you? Can you see one person intuitively following the sun, using qualitative, bottom-line type information? Can you see the other person with all his detailed measurements and data, using structured, detailed information? Does this figure drive home the difference between a sensing person and an

intuitive person who are both dealing with the same problem? Can you carry those ideas over to how we should portray information differently to different decision makers faced with the same decision? If you answer yes to these questions, you're probably intuitive. I've portrayed information to you in a way that you get the most information quickest. If you answer no to these questions or if the ideas in the questions didn't occur to you based on the illustration, you're probably sensing. I've portrayed information to you in a way that I slow you down in your understanding of the information.

Most people in the world are sensing. I'm intuitive. Now what do I do with my information portrayal? (One important issue in comparing two information portrayals to distinguish preferences between intuitive and sensing people is that both portrayals must have the same information content, only in different form. Getting the exact information content into two different forms isn't easy because information is biased and the form contributes to the bias.)

An interesting point arises here. As a presenter, I do a better job (I'm more confident and enthusiastic.) with illustrations. When I present to a group of largely systematic people,

they'll prefer not to deal with illustrations. For an effective presentation, both presenter and audience should work well together. Whose preference should dictate? Obviously the presenter's and the audience's preferences should be balanced. Now I'm dealing with a different interface with two sides. This interface is between sender and receiver of information. This interface is much like the information portrayal/information perception interface.

I've seen staff people complain when the manager who must present the organization's case is picky over the words the staff has prepared for his or her presentation. I argue that if the manager's preference is satisfied, he or she is going to be more comfortable and confident—necessary characteristics for an effective presentation to benefit the organization.

In processing information, our brains tend to perceive stimuli in terms of their own past experiences and may systematically filter out information not in accordance with these experiences. Brains have difficulty processing all the relevant information—there is too much, it may not fit with expectations and previous patterns, and some of it simply may be too threatening to accept.



Figure 1.4.2.8.4. *“We’ll probably get out of here about the same time.”*

1.4.2.8.5. CAN WE PREDICT HOW YOU WANT YOUR INFORMATION PORTRAYED?

If you know what a person prefers, you can support their information perception and action taking better.

Who can predict what a person will do? Or what they'll prefer? We certainly believe people are different. Each person has his or her own way of doing things—his or her own style. Each person has his or her own experiences, capabilities, and preferences. Can we measure something about a person to determine how the person will behave given a certain situation (environment)? I believe we can measure a person's personality type or cognitive style. This measurement will tell us how they *prefer* to behave, not necessarily how they *will* behave. If we can distinguish among people and how they perceive information and how they act on the information they have, then we should be able to choose the best way to portray information for them.

Scott Geller tells us that to look at the output of a person we must consider a triangle of three factors: person, behavior, and environment. We're interested in decision making and action behavior on the part of the person who's the who manages. I'll describe some people differences and how those differences affect tool building. I'll start by distinguishing among personality types. Then I'll match ways of portraying information to those different types.

In 1920 C.G. Jung suggested that people are different in fundamental ways. All people are driven by the same group of instincts. One instinct is no more important than another. But what is important is a person's preference for what he or she does. The person's preference for what they do is characteristic. So the person can be "typed" by these characteristics. And Jung developed personality types. For decades scholars have spoken of different temperaments for people and they usually have

decided on four different temperaments. In the 1950's Isabel Myers and her mother Katheryn Briggs picked up the ideas of temperaments and personality types and produced the Meyers-Briggs Type Indicator, or the MBTI. The MBTI is in the form of a questionnaire where people select answers according to their preferences.

When we see the results of a person's preferences, we determine their MBTI type. The MBTI type is a four-letter code devised from the words symbolizing the four polarities suggested by Jung shown in Figure 1.4.2.8.5. The second pair of polarities is of greatest interest to us now. The sensing/intuitive polarity tells us how a person prefers to perceive information. In short, sensing people like details and structure and intuitive people like pictures and trends.

From Figure 1.4.2.8.5., note that most of the people in the world are sensing. Note also how they like to perceive information. So, if our state-of-the-art computer-based information system is based on color, graphics, and images, most of the people in the world won't like the information system. Unless managers are selectively intuitive, most managers in the world won't like our information system. Surely, what a manager doesn't like, a manager won't use. Since a manager is anyone who uses information to make decisions, people in general won't like or use such a system.

From Figure 1.4.2.8.5., note how different people act on information. The thinking/feeling polarity is the only one where we've found gender differences. 60% of men are T; 60% of women are F. T and F are, however,

evenly distributed within the overall population.

The fourth polarity distinguishes between those who prefer to perceive information and those who prefer to act on it. A perceptive person wants more information to perceive before acting on it (making a decision). A judgmental person wants to make a decision with as little information as possible. Judgmental people are into closure. They make decisions. They have clean desks. Perceptive people expand the problem. They're into possibilities.

Think about interacting with your boss. Suppose your boss is judgmental and likes to close on a problem given the least amount of information needed. Suppose you're a perceptive person and see possibilities in everything and want to bring as much information as possible to the decision to ensure no alternative is neglected. Won't your boss be frustrated as you're doing your best—unless you know about the differences between those people who like to act on information and those who like to perceive information?

The first polarity shown in Figure 1.4.2.8.5., has to do with whether you prefer to deal with people and things (the extrovert) or ideas and concepts (the introvert). The extrovert is energized at a party and is ready for action afterwards. The introvert isn't and wants to be alone and needs to rest from the exertion.

We identify the four temperaments I mentioned earlier as the NT, NF, SJ, and SP type people. We call them 1) the visionaries, architects of systems, builders; 2) the catalysts, spokespeople, energizers; 3) the traditionalists, stabilizers, consolidators; and 4) the trouble-shooters, negotiators, fire-fighters; respectively.

Certainly, no one personality type is better than another. Also, in team building, we find a good

mix of personality types makes the most effective team. Personality typing is popular today. Team building and marriage and family counseling are often based on the personality types of the participants. Marriages tend to be good if spouses share at least two of the four polarities. Having three polarities the same is better. Introverts tend to marry extroverts. If you marry your polar opposite, good luck. The marriage can work, but the pair wakes up every morning with two completely different theories of and attitudes toward the world and human existence.

Some companies even hire based on certain personality types for certain jobs. This practice is not only unethical, and probably illegal, it's foolish. My wife is an introvert; but, you wouldn't know it at a party. I'm the extrovert and she's much more social and gracious at the party than I am. She's good at being an extrovert. She just doesn't prefer it. You'd know my wife is an introvert when we get in the car after the party, she's exhausted and I'm energized. Dealing with people and things draws energy from her and builds energy in me. The bottom line is that if you choose me over my wife to get the best extrovert, you'd make a terrible mistake. My wife has all the energy she needs to be all the extrovert you can handle. Never rank people's behavior based on their preferences. Deming tells us never to rank people on their performance. Similarly, we should never rank behavior based on preferences either.

Bariff and Lusk propose that “generally accepted psychological tests be used by the systems analyst to evaluate user preferences for report presentation modes” in designing information systems. They list dozens of psychological tests and measures of user and organizational behavior variables. The MBTI is but one of the tests. Many more tests have been devised since the time of the Bariff and Lusk article. However, the MBTI continues to be the most generally popular personality typing

instrument today. (*Designing Information Systems for Organizational Control: The Use of Psychological Tests*, North-Holland Publishing Company, 1978, pp. 113-121.)

The bottom line is people don't all like the same things. Or use the same things. Or do the same things. To be successful in management tool building, we have to consider what's special about the who manages component of the Management System Model. We need to

know what's special about the manager in terms of how he or she likes his or her information portrayed. I've offered the MBTI as a way of predicting not only how information ought to be portrayed in a given domain, but as a way of predicting how the information will be acted on and the relative dominance of perceiving or acting. Regardless of the measures you use to interpret a person's preference, be sure to consider the individuality of the manager when you develop a management tool.

JUNG'S THEORY CONTAINS FOUR POLARITIES.

<p><i>Extrovert</i> (75% of population).....</p> <ul style="list-style-type: none"> People and things Sociability Many relationships Expending energy Interest in external events 	<p><i>Introvert</i> (25% of population)</p> <ul style="list-style-type: none"> Ideas and concepts Territoriality Few relationships Conserving energy Interest in internal reactions
<p><i>Sensing</i> (75% of population).....</p> <ul style="list-style-type: none"> Detail and structure Experience Realistic Fact (data) Practicality 	<p><i>Intuitive</i> (25% of population)</p> <ul style="list-style-type: none"> Generality Hunches Speculative Fiction (stories and pictures) Ingenuity
<p><i>Thinking</i> (50% of population— 40% females 60% males).....</p> <ul style="list-style-type: none"> Logic and rationality Objective Laws and orders Firmness Analysis 	<p><i>Feeling</i> (50% of population)</p> <ul style="list-style-type: none"> Relationships Subjective Circumstances and social importance Persuasion Sympathy
<p><i>Judgmental</i> (50% of population).....</p> <ul style="list-style-type: none"> Less information Limit the problem Fixed and decisive Closure Sees deadline 	<p><i>Perceptive</i> (50% of population)</p> <ul style="list-style-type: none"> More information Expand the problem Flexible and tentative Open options Sees possibilities

Figure 1.4.2.8.5. Key words help distinguish between pairs of identifiers for each of Jung's four polarities.

1.4.2.8.6. MANAGING INFORMAL INFORMATION

Important information is too current, sensitive, or opinionated to formalize. We automate formal information to save time so managers can deal with informal information.

Communication is effectively transferring information. You have formal and informal communications and routine and non-routine communications and internal and external communications. You must recognize the types and extent of information flow necessary to accomplish your mission. Additionally, you must be concerned about the huge opportunity for allowing critical information to fall through cracks, generating inaccurate information, sending multiple and conflicting signals, and lacking timeliness.

Furthermore, let's look at informal information used by managers more often than the formal information we can get from an information system. Next time you're in a meeting and someone comments on a sensitive subject, listen to his words and watch his face and body language. Do the words agree with his gestures? Which do you believe the most? We all have people we call to get informal information that is too current, sensitive, or opinionated to formalize. We make our critical decisions based on our most trusted sources of informal information. ("Your applicant's credentials may look great, but after a week working for us he had everyone hating him, so don't hire him. What? No, I couldn't put that in writing.") We don't have time to verify or corroborate the information to formalize it. After the decision is made, the information will be formalized and kept for historical reference and trends.

We formulate data easier than we formulate information. Facts tend to be less sensitive and less threatening than bias. Automation won't help for informal communication because judgment is used. Nevertheless, informal commu-

nication is necessary, good, and must be managed. (Isn't this something? The best stuff we can't automate. Deming says the important information is unknown and unknowable. Now what?) Our goal is to automate as much as we can to save more time for judgment.

A government manager upon hearing I thought informal communication should be managed said, "Oh, then informal communication must be bad." Of course not. Control can mean directed or curbed. Directed is good, curbed is bad. If we plan on and use informal communication, we're acting, not reacting. This manager was reacting to the fact that he spends so much time dealing with problems, he sees management as curing rather than preventing or maintaining. (In management today we want to head off painful cures like the one in Figure 1.4.2.8.6. Instead, we want to act ahead of time based on important information, much of which is informal and unvalidated to head off painful problems.)

A major reason managers don't use formal information as specialists think they should is that managers find difficulties with the MIS—too limited (data not rich, ignore non-quantitative data, loses verbal channels, weak in external communication) and often too general (need tangible detail and more intelligent filtering process), too late and too unreliable. Instead, managers turn to ad hoc, informal information systems that they design and prove for themselves.

Routine information is expected and we've planned for it. Nonroutine information (both formal and informal) relates to change, and change relates to opportunity. Our manage-

ment tools have to be responsive to help with nonroutine information.

Internal information is that in which both the sender and receiver are within your domain of responsibility. Often informal communica-

tion is quite effective for honesty and speed. The consequences of ineffective internal communication are mostly internal. External information must be furnished. You're responsible for either the sender or the receiver and can document what is done.



Figure 1.4.2.8.6. "This won't hurt a bit...."

1.4.2.8.7. THE DECISION/ACTION INTERFACE

“If information is not utilized even a technically well designed system may be considered a failure.” Macintosh and Daft, 1978.

Since in most cases humans make the decisions, we must provide only information *absolutely needed* for the decisions of who manages. With this thought, we proceed to the decision/action interface. Decisions that don't lead to actions aren't worth making and certainly aren't worth supporting with information. You must be selective with your information requirements, or you'll inundate yourself with the data needed to produce your information. As you can see in Figure 1.4.2.8.7. if you don't know who does what to whom as a result of information (makes a decision that leads to action affecting what is managed)—don't invest your precious resources in that information.

Think about the decisions you make. We're interested in 1) how or which decisions lead to actions that count and 2) what you need to make good decisions. Decisions require information and information requires data, and there we have the linkage between the interfaces of the Management System Model (MSM) looking in the direction from actions toward decisions. Ask yourself questions like, “What are the first three things I want to know about the office when I get back from vacation?” Jay Forrester says that management is the process of converting information into action. The conversion process we call decision-making. Decision-making is in turn controlled by various explicit and implicit policies of behavior. Management success depends primarily on what information is chosen and how the conversion is executed. The manager then is an information converter.

List a sampling of the decisions you make—not just different instances of the same type of

decision. Follow-up with a corresponding list of the impact of each example decision. Every decision must have a purpose. Don't ask for information you aren't going to use. What idealistic information document (text as in plans, letters, or reports; checklists, as in forms or tickler files; graphics, as in pie charts or illustration; and tables) would you like to put you in the best position to make an effective decision. Ask yourself why you chose the document you did.

Many studies scrutinize the decision-making process, most notably those of H.A. Simon. He developed three phases of the decision making process. The first phase involves searching the environment for conditions calling for decision, the intelligence phase. The second phase is the design phase—inventing, developing, and analyzing possible courses of action. The choice phase is the third and includes selecting a particular course of action from those available.

I relate effective actions based on decisions to lessons learned in emergency management. Emergency management highlights the decision/action/impact relationship. Emergency management has three stages cycling in the following order: planning, preparedness, and response. Emergency management, being the most intense form of anticipating and managing can direct us toward dealing with any change—the things we make decisions for. In planning, the manager needs to think and analyze, structure, and proact. (Although not in the dictionary, proact is a much-used term today when talking about a manager's actions. Proact means to act in a way that you cause something you want to happen, as opposed to

react, where you act as a result of something that has happened. In terms of a control theory analogy, you want to be in a feed forward mode, rather than in a feedback mode.) In preparing, the manager needs to make ready,

to critique, and react. The object of preparing is to identify where we aren't ready. Reacting is necessary and valuable at this time. In responding, the manager reviews, decides, and acts.

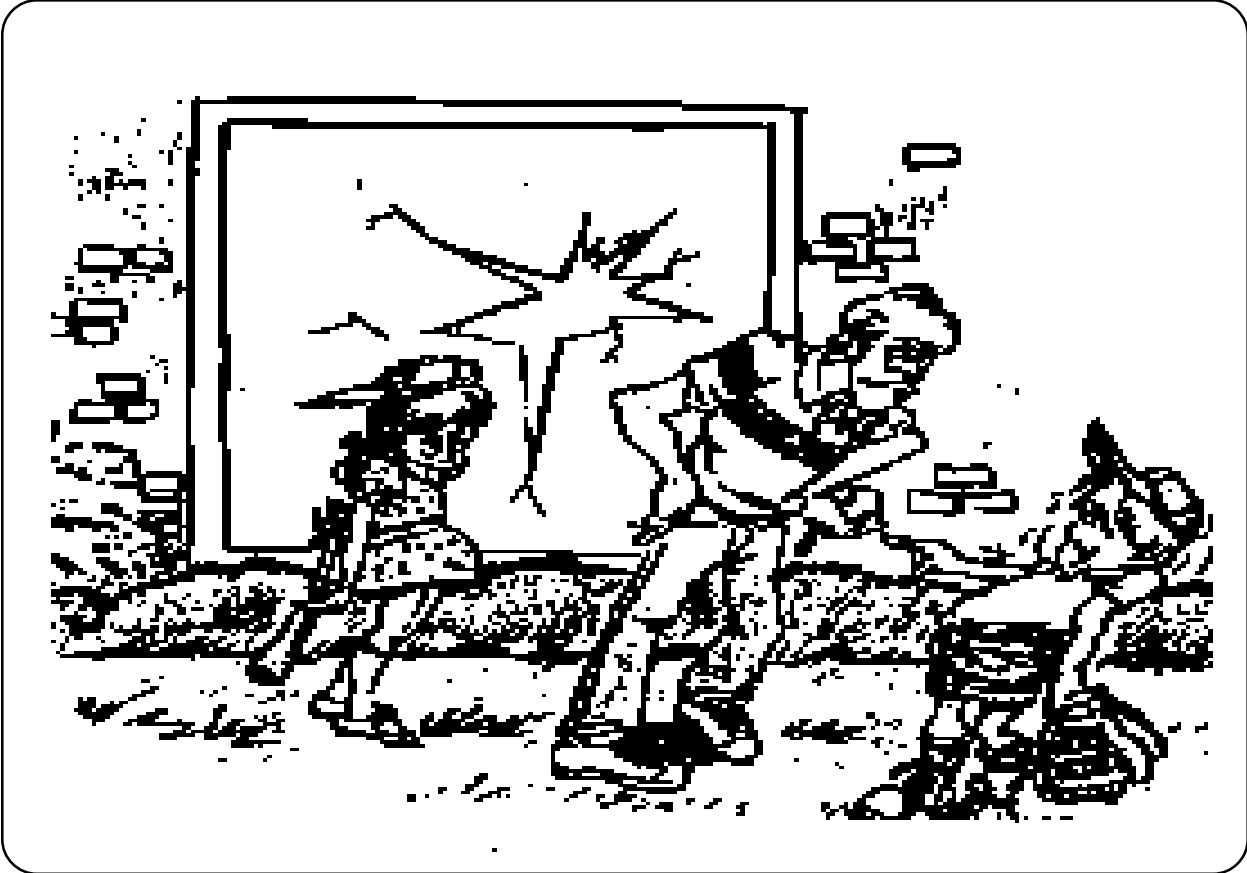


Figure 1.4.2.8.7. *Guess who does what to whom as a result of which information.*

1.4.2.8.8. PETER DRUCKER'S VIEW

1.4.2.8.9. THE MEASUREMENT/DATA INTERFACE

We often use mechanisms for sensing indicators, collecting data, and making information in a single container, thereby making the division between measurement and data difficult to see.

Recall the information portrayal/information perception interface for a moment and generalize to the measurement/data interface. The information tools perform a conversion process and present, or portray, the result of that process. The manager looks for and perceives that presentation. The manager needs the result of the management tools' process to do his or her job, which is a decision making process. Likewise the operation performs a conversion process and presents, or portrays, the result of that process. The result is the product or service and associated waste streams. The portrayal includes indicators for measuring the conversion process, or work process, and the result of the process, or the product, service, and waste. The management tools look for and perceive that portrayal. If you will, the sensors, whether mechanical or human, focus on an indicator (a parameter to be measured) and generate data. If the sensor is an optic, magnetic, or proximity device, the output is voltage. What the sensor senses is the indicator, or the measurement, and what the sensor generates is data.

With this conversion in mind, we realize we can generate another component including a conversion process at the measurement/data interface. With my voltage example, the sensor only generates data. Not until we calibrate the sensor against a standard or compare the voltage or its interpretation against another datum do we get information.

I recognize that in many devices today, we find the sensor and the data-to-information converter in the same container. I separate the sensing function from the information-generation

function for understanding the Management System Model (MSM). Recall that in the using management tool functions in Figure 1.1.21.5., we have one function for determining indicators and reference points and another function for collecting and logging data. These functions reflect the two sides of the measurement/data interface.

To continue the discussion of possible additional components and conversion processes at an interface of the MSM, consider the decision/action interface. We would call a component making the decision-to-action conversion an actuator. We can also consider a component to make the portrayal-to-perception conversion at the information portrayal/information perception interface. The glaring disadvantage of adding components to the MSM, and of course more interfaces between pairs of components, is the rapid increase in complexity. However, if your focus is on the conversion process from decisions to actions in an actuator, you may want to encumber the MSM.

Just as management tools (the what is used to manage component) form a conversion process yielding good, bad, and relevant information (based on measures of timeliness, accuracy, and relevance), the operation (what is managed component) forms a conversion process (work process) yielding good, bad, and relevant data. I'll describe good, bad, and relevant in terms of data and information when I discuss information-oriented performance factors in more detail.

The operation also yields output to the envi-

ronment, including the product or service and the waste and by-products. From an internal view, we're interested in data from the operation showing the status and progress of the operation in terms of the operation's expectation in the form of reference points and standards. Just as who manages reflects a bias for choosing and interpreting information, management tools reflect a bias for the data they can use and what they do with the data. Since management tools are in your head, they're more conceptual than the word tools suggests. The mechanization of a management tool, like a book for a plan, a chart for an organization structure, or a computer for the data-to-infor-

mation chain are part of the operation tools. The data and information and their form are the management tools. You can see that formal management tools as we deal with them spread across the measurement/data interface and include part of what is managed and part of what is used to manage. Informal management tools usually include people providing the informal data and information (usually heavily biased information). The people are either part of the what is managed component or part of the environment of the management system. The what is used to manage component is a conceptual component. That's okay; so is the who manages component.

1.4.2.9. INPUTS AND OUTPUTS TO COMPONENTS

1.4.2.10. THE CONTROL LOOP ANALOGY

1.4.2.11. HIERARCHICAL SYSTEMS

1.4.2.12. OTHER ANALOGIES
