PITFALLS IN MIS DEVELOPMENT

FUNDAMENTAL WEAKNESSES

1. *No Management System to Build Upon*

   For some reason many managers think that they can patch up a company's shortcomings in basic management systems by applying a computerized management information system as a band-aid. Unfortunately, this will not work. If good planning and control do not exist within the framework of a good organizational structure, no degree of sophistication with a computer is going to cure the basic ill. The MIS must be built on top of a management system that includes the organizational arrangements, the structure and procedures for adequate planning and control, the clear establishment of objectives, and all the other manifestations of good organization and management.

   The lack of managerial and operational applications (as opposed to accounting and clerical applications) is serious, because it implies that the process of management is not being performed well. If we can say (as we must) that information is the raw material of decision making, and if information is not being generated, disseminated, and used for management, then no system-manual or computer-is going to solve the problem.

2. *What business are we in?*

   Not having a crisply stated mission and purpose for the company is a common weakness. This problem evolves from the firm's top management wanting to be (or being comfortable with being) operating managers. Top management focuses on the day-to-day operational problems and abdicates the responsibilities of providing a future for the company. The results are as you would expect. Since it is not terribly clear what business we are in, each major challenge the company must face is a completely new challenge and must be analyzed from the ground up. If there was a mission statement, some of these problems could be dealt with routinely as opposed to their being major crises.

   Much of the guidance for what the MIS should do rests on a clear idea of what business the firm is in. Many of the constraints on the MIS are derived from knowing what business the company is in and what business it will be in. Without this background information, the MIS mayor may not satisfy management needs.

3. *Company Objectives*

   Written objectives are also often missing in a company. A firm without objectives is much
like a company without a statement of mission and purpose—it is a ship without a rudder. This problem evolved in the same way the previous one did. Top management failed to set objectives for the company. The results are also similar. Everyone in the company is left without the benefit of the guidance that objectives give. For example, clear objectives provide decision-making criteria when problems arise. Without these objectives, not only is each problem a major new challenge, but each time a problem arises, management must generate decision-making criteria for this case before it can attack the problem.

4. Managerial participation

Of all the reasons for MIS failure, lack of managerial participation probably heads the list. Dozens of studies on hundreds of companies have concluded that the most striking characteristic of the successful company is that MIS development has been viewed as a responsibility of management. This includes both top management and operating line management. The reasonable conclusion that managers must reach is that MIS is too important to be left to the computer technician.

There are three good arguments for managerial participation. First, the time has come when the up-to-date manager must bring to the job at least a minimal familiarity with the topic of MIS. Second, from the point of view of the organization, the time is rapidly approaching when a company's information system will become a vital part of its operation just as marketing, operations, and finance are today. Third, it simply makes good sense for managers to become involved, because much better and more effective information systems will be the result of that involvement.

5. Organization of the MIS function

Another significant cause of computer failure is the lack of proper organization of the EDP and MIS function. When computers first burst upon the business scene in the late 1950s and early 1960s, the only practical applications were concerned with the automation of clerical work: accounting, payroll, inventory reporting, and similar financial jobs. Following the classical organizational principle of assignment of a service activity by familiarity, the overwhelming trend at that time was to assign the computer to the controller or the chief accountant. Unfortunately, this is where it has remained in many companies. The result has been a disproportionate emphasis on accounting and related clerical work.

The exact location in the organization and the authority granted to the MIS manager is, of course, a function of the type of business the firm is in and how important the information resource is to its operation.
6. **Reliance on Consultant or Manufacturer**

   Some computer manufacturers and some consultants will try to sell the turnkey system, one that is designed and debugged and ready for its buyer to push the button or turn the key. Although some complete packages exist (there are several truly excellent offerings), be careful! In most cases, the consultant or manufacturer is concerned more with the machine than with management solutions. Before buying a "solution" from a consultant or manufacturer, be sure that it is the whole solution, that you understand it thoroughly, and that you understand your legal recourse when things do not work the way you expected.

   There are other good reasons for going slow in allowing consultants or manufacturers to make your computer and MIS decisions. First, there is a good chance that you will have to spend a great deal of time educating them in the operations of your company before they are in a position to make recommendations. Second, installing the system without substantial preparation is likely to result in some chaos. And third—and this is a general rule—if the buyer does not have the personnel capable of designing the organization's MIS, it is unlikely that it will have the expertise to operate those that were designed and installed by the outsider.

7. **Communications Gap**

   It is unlikely that for the foreseeable future the computer technician (EDP manager, systems analyst, programmer, management scientist) will be able to speak the language of management, and managers for the most part are not prepared to speak the language of the computer. The result is a communications gap that sometimes causes a design standoff.

   Technicians have little appreciation of the process of management or of the problems of managers. Operation of the machine is their" thing." They measure their performance by how many shifts the computer is running and how much printout or output they can generate. Given the choice, technicians will give the user all the data contained in the system pertaining to the user's problem. Thus the sales manager who asks for the sales performance report is likely to get computer printout in a stack two feet high. What he really wants is an exception report that highlights significant variances from plan.

   On the other hand, the manager is not without guilt. Unless he's been to a business school or a good seminar recently, he is not likely to be very knowledgeable about the computer and how it can be used to help him improve his operations.

8. **The people involved**

   Whether we are talking about the management team, the MIS specialists, or the people who are doing the company's main work (and will be the MIS users), one criterion is overriding:
there is no substitute for competence. The performance of employees (including managers) can be compared as follows:

- Good performers are an order of magnitude more productive than average performers. Given tools from the Stone Age and no light to work by, good performers will produce good results. Average performers can be made productive only in the right environment.
- Average performers are infinitely more productive than poor performers. In fact, poor performers produce negative work; that is, someone else's time is spent fixing poor performers' messes.

The moral of the preceding paragraph is that you can guarantee success with your MIS if the key management spots, the key MIS roles, and the key user positions are occupied by good performers. The degree to which one relies on average or poor performers in these key places is the degree to which the project will probably fail. If the key managers involved are poor managers, the MIS will almost certainly be a failure. If the key MIS roles are occupied by poor performers, a respectable result is possible only with extra time and extra management involvement. If the key user positions are held by poor performers, more education and selling is required and the user interface to the MIS must be enhanced greatly to increase correct input and to make the output more easily understood.

There is no substitute for competence. Hire only good performers. They are well worth the price.

All these pitfalls are really general weaknesses in the company as a whole. They could (and do) show up anywhere in the firm. Due to the complexities of MIS development projects, these problems are guaranteed to show up quickly and harshly. Information systems are not a solution to any of these problems, only the medium by which they become obvious to the organization. However, these deficiencies in the firm's infrastructure must be corrected before an MIS can truly succeed.

**SOFT SPOTS IN PLANNING**

i. **MIS Response to Business Plans**

One of the great hazards of MIS planning is the tendency to forget the original purpose of management information systems. Management information systems exist solely to assist line management in executing the main business of the company. Each step the MIS or computer group goes beyond that definition of their role is waste of company resource.

The purpose of the MIS group is to support line management in the company's main
business. As business plans are made and modified, the corresponding MIS plans must be made and changed. Each MIS plan must be a proper response to a business plan.

ii. **A System View, a Master Plan**

Another cause of computer failure is the lack of a master plan to which hardware development and individual MIS designs can be related. Without such a plan, the result is likely to be a patchwork approach that will result in islands of mechanization with little integration between separate systems. In other words, we need a systems approach to MIS development.

This patchwork or piecemeal approach to systems development, which lacks a unifying framework and is without a master plan, has several disadvantages.

The reasons for MIS planning are the same as for planning in general: it offsets uncertainty, improves economy of operations, focuses on the objectives, and provides a device for subsequent control of operations. If the patchwork approach is allowed to progress too far, it may be too expensive to start again from scratch and redesign to an integrated master plan.

iii. **One-for-One Conversion**

The worst possible approach to systems design is the one-for-one conversion, which occurs when a technician takes an existing manual or computer system and converts or modifies it without upgrading or changing it.

iv. **Setting Project and System Objectives**

Setting objectives for projects and systems is not itself a planning activity. However, no meaningful plans can be made until these objectives have at least been roughed in. Conversely, no serious objectives can be set until some of the general planning variables are known. These two activities (setting objectives and planning) are co-requisite.

The pitfall for those developing an MIS is trying to do either of these tasks before the other. The proper way to approach the problem is to decide what kind of system/project is desired (in general terms).

v. **Facing Constraints**

Many people believe that perfect freedom is a good thing and that the fewer constraints, the freer they are. More sober reflection on this problem will probably reverse most adherents' views. Complete freedom from automobile driving restrictions would allow people to drive anywhere on the road and would lead to horrible accidents. Freedom from social restraints leads to anarchy and its attendant woes. Similarly, freedom from constraints on

- Functional definition
• System performance
• System cost
• Development schedules

will lead to enormous MIS problems.

vi. Plan to sell MIS
Most systems designers admit to the unpleasant reality that the toughest part of designing and implementing an MIS is gaining acceptance of the users for whom the system is designed. The fact is that many people will not only resist a new system, but what is worse, they will work around it, continue to use the old system, and in many cases sabotage the new system. Yet resistance to MIS is not inherent or automatic. People only resist things that they fear or do not understand.

The first and major step in learning how to overcome resistance to a new MIS is to try and gain some understanding of the reasons for resistance. This understanding will give the designer and the manager a new attitude toward resistance and go a long way toward helping to overcome it. Indeed, this understanding and this attitude, if achieved, constitute about the best answer that behavioral science has to offer. After all, resistance to MIS is nothing more than a special case of the general problem of resistance to change.

vii. Detailed Planning
detailed planning is the hallmark of the real professional. The more experienced one becomes, the more clearly we see the need for detailed planning. It is the only method that permits one successful MIS project to follow another. All veteran MIS development managers know this and plan in detail for every phase of the project. Do not apologize for the money or time spent laying out good plans—they will payoff many times over.

viii. The Mythical Man-Month
people and months are not interchangeable; hence the "man-month" as a unit for measuring the size of a job is a dangerous and deceptive myth. This is a critical fact to be reckoned with in all MIS planning.

This problem, viewed from any angle, is a planning problem. Once we know about the pitfall, we are expected to plan around it. This means that for projects involving a very few people (less than 5), normal productivity estimates are acceptable. For larger projects (25 to 50), productivity per person may drop 25 to 30 percent due to project complexity and
interpersonal communications requirements. On very large projects (hundreds of people), a 50 percent or more productivity drop may be reasonable. The morals are
- Plan for complexity and communications costs.
- Run small projects (rather than large) when possible.

ix. Planning for Maintenance
Few MIS development managers do any planning for maintenance. There are all good personal reasons for avoiding maintenance work, but management is paid for facing hard problems for the company and solving them. Planning for maintenance is the solution to the reality that maintenance is necessary

DESIGN PROBLEMS

i. Consider Alternative Designs
During the early stages of design, as many ideas as possible should be considered. As time passes, the alternatives should dwindle to two or three. And by the time detailed design starts, one conceptual design should have been chosen. The error usually made here is not considering numerous ideas at the outset.

One possible solution to this problem is for the manager to require the key designer to layout several alternative designs and explain the positive and negative features of each.

ii. Hard Trade-Offs
Making difficult decisions is not something that most people want to do. However, many tough choices will face the key designer and the MIS development manager. A problem arises if either or both of these people cannot or will not make a required decision.

iii. The Real world as Acid Test
most businesses are not research institutions. The MIS is being implemented to support the firm's main line of business, not to extend the state of the art in MIS design. Although it is fun to do new and creative things, the practical need is for an MIS that solves today's real problems. Design systems that are implementable with today's known and tried technology.

iv. If it moves, Automate it
Some things could be automated, but good sense tells us not to. For example, we could easily design and implement an application to replace the receptionists in most firms.

Another aspect of this problem is over automation, for example, using a computer terminal in place of a pocket calculator or desk-top adding machine. The overhead and complexity introduced to perform simple arithmetic functions are just not worth it.
v. **The Computer Obsession**

that the computer is just one of several elements, and probably not the most important (people are). The computer is nothing but a tool for people to use in getting their jobs done more effectively and efficiently. The computer seldom makes mistakes (it usually operates as instructed but may be operating on bad input or instructions). On the other hand, the computer never makes any original decisions and never has any good ideas.

vi. **Documentation**

This problem spans the planning, design, and implementation phases. The dilemma the MIS team faces is how much of their work needs documenting. Documentation can become the great, white tide that buries everything in its path (a real threat in these days of high-speed printers). Certain items must be documented and in considerable detail:

1. All plans (including budgets and schedules)
2. Project and system objectives
3. Specifications of function and performance
4. User interface specifications
5. User instruction and reference manuals (including procedures)
6. Maintenance guidance material

**IMPLEMENTATION: THE TAR PIT**

i. **Hardware Perspective**

Managers proudly show off their computer centers, discussing the amount of disk space they have and the millions of instructions per second the processors will execute and the thousands of square feet occupied by all this hardware. These are all forgivable human antics—we all like to show off our new sports cars. But let us ask the hard question of management: "How should the hardware question be approached?" The answer is, "Last."

ii. **Software Development**

Another pitfall in software development is both hardware and personnel related. The software must be perfect, without error. The hardware does exactly what it is told; hence, incorrect incantations result in the wrong magic.

iii. **Test It and Test It Again**

The most common error made with regard to testing is not planning to do enough of it. A good rule of thumb to use in project estimating and planning is
! implementation

! testing

For an MIS project of any reasonable size, this figure for testing is by no means too much. Testing must be done at the function level, the component level, and the system level. Problems will be discovered at each level, and solutions must be found. A good manager will recognize this phenomenon from the start and plan accordingly.