BUSINESS SYSTEMS PLANNING

IBM

Information Systems Planning Guide

GE20-0527-2

BUSINESS SYSTEMS PLANNING

IBM

Information Systems Planning Guide

Business Systems Planning (BSP) is a structured approach to help an organization establish an information systems plan that can satisfy its near- and long-term information needs. This guide offers assistance to BSP study teams by explaining the approach and presenting guidelines for conducting a BSP study. It can also be used for general reference on the subject of planning for information systems.

The guide covers BSP principles, concepts, and study overview, then devotes a chapter to each of the major activities of a BSP study, and includes a final chapter to acquaint the reader with follow-on projects.

Second Edition (October 1978)

A form for readers' comments has been provided at the back of this publication. If the form has been removed, address comments to IBM Corporation, Technical Publications, Dept. 824, 1133 Westchester Avenue, White Plains, New York 10604. IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever.

Preface

Business Systems Planning (BSP) is a structured approach to assist a business in establishing an information systems plan to satisfy its near- and long-term information needs. The primary purpose of this guide is to assist BSP study team members by explaining the approach and presenting specific guidelines for conducting a BSP study. The guide may also be used for general reference on the subject of planning for information systems. The reader does not need a knowledge of computers to understand the concepts and to apply the methodology.

Experience has shown that BSP can be applied to all the public sector and all industries in the private sector, because the requirements for developing information systems are similar regardless of the business served or the products and services provided. For the sake of simplicity, throughout this manual the term *business* is used for the organization entity being studied, regardless of its size or purpose, and whether private or public.

Before initiating a BSP study, the personnel involved should consider taking the appropriate BSP-related courses. Information on the educational offerings is available through local IBM branch offices.

Because IBM cannot control the manner in which this methodology is applied, it takes no responsibility for the results. Hundreds of studies have been completed successfully using this approach; this guide represents as much of that experience as it is feasible to include.

This guide is organized so that readers already familiar with BSP can go directly to the material they require, while others may progress serially through principles, concepts, methodology overview, methodology details, and finally the alternatives and the reference material in the appendices. The introduction is for those persons who may have heard of BSP but do not know its purpose or origin. Chapter 1 presents the concepts that form the basis for the methodology, so that the reader can understand the basic principles without becoming embroiled in the detail of how BSP is done. Even persons with some orientation or training in the subject may wish to read the introduction and Chapter 1 to strengthen their understanding.

Chapter 2 provides an overview of all the activities in a BSP study so that the reader will be prepared for the details in the following chapters.

Chapter 3 deals with getting the proper executive commitment before starting a BSP study.

Chapter 4 discusses the activities that take place before the BSP team starts its concentrated study. It also outlines the considerations that must be made in the management of the study.

Chapters 5-15 cover the details of the methodology, culminating in the writing of the final report and the making of recommendations to the business executives. Since each step of the methodology can probably be done a number of ways, a single, cohesive methodology is outlined and alternatives, where appropriate, are included at the end of each chapter or in the appendices. For continuity from step to step, all examples are based on the same business, a medium-size manufacturing firm, except those in the appendices, which are based on various industries and the public sector.

Chapter 16 gives an introduction to the follow-on projects so that an action plan for them may be developed during the BSP study.

Contents

Figures

Introduction

The Changing Environment

The rapidly changing environment and the constant need for businesses to adjust quickly to it make it necessary for executive management to have up-to-date information available at all times, so that through meaningful analyses and resource allocation tradeoffs they can manage their businesses more effectively. With organization-wide availability of information, strategies can be improved, decisions made more soundly, and operations performed more efficiently.

From Operation to Management Control

Data processing is in transition. Until comparatively recently, most businesses considered it a service function and used it to support single-operation units or locations. In the last two decades applications have been developed independently, with very little regard for the support they could give other functions and for the information they could supply for management control. Functional autonomy has been the rule. This has resulted in fractionalized and redundant data files and in the inaccessibility of data from the many operational applications installed in the various functions.

Today, however, businesses are recognizing data more and more as a resource that is as important as personnel, cash, facilities, or materials. They see the need to consolidate the key data files and make information available not just to individual functions or departments but throughout the business, in order for management to gain a business-wide view and be able to make multifunctional decisions.

Many companies have recognized the need for company-wide information systems but have been unable to develop them for one or more of the following reasons:

- Failing to obtain executive commitment and involvement
- Establishing objectives and strategies that were not in line with their overall business objectives
- Attempting to implement information systems without first understanding the business from general management's viewpoint
- Setting out to implement totally new company-wide information systems rather than a comprehensive plan evolving from current systems
- Failing to put in place those information systems management functions required to adequately manage the information systems resources

A Justified Approach

In an article entitled "Blueprint for MIS," * Dr. William Zani states, "Traditionally, management information systems have not really been designed at all. They have been spun off as by-products while improving existing systems within a company. No tool has proved so disappointing in use. I trace this disappointment to the fact that most management information systems have been developed in the "bottom-up" fashion – an effective system, under normal conditions, can only be born of a carefully planned, rational design that looks down from the top, the natural vantage point of the managers who will use it."

In most instances the current operational systems have been justified and have been performing effectively for their specific intent, even though their maintenance and interfaces may have become unmanageable. An information system plan should allow a modular approach to implementation, providing confidence that each module will fit and function properly in an integrated network and will interface properly with the present operating systems until they too can be included in that network. The plan should also allow for better decisions concerning the efficient and effective commitment of information systems development resources. With such a plan, the required information can be more readily obtained.

Business Systems Planning (BSP) is geared to help provide such a plan through:

- A top-down approach to (1) getting people committed and involved (starting with top management and working down through the organization) and (2) studying the business (working from the overall to the detail level)
- A bottom-up approach to implementation
- Use of a structured methodology proven in hundreds of studies
- The translation of business objectives into information requirements

The effectiveness of the BSP methodology can be attributed to two components:

- The fundamental principles and concepts – the unvarying ideas and logic that form the basis for BSP, including the standards upon which the procedures are based

*Harvard Business Review, November/December, 1970

- The sequenced activities, techniques, disciplines, time, outputs, planning, team composition, etc., established to fill a particular organization's need and situation (although consistent with BSP's basic principles and concepts, the procedures are flexible and vary with the particular environment)

Origin of IBM's Business Systems Planning Function

Learning from its own mistakes and those of other companies that attempted to implement large information systems in the 1960s, IBM realized that a disciplined approach was required, using proven principles and methodologies. In 1966 a business-wide Information Systems Control and Planning Department was established at IBM's Data Processing Group headquarters. The Data Processing Group was a total business unit comprising the engineering, manufacturing, marketing, and service divisions responsible for all of IBM's domestic data processing business.

Until the Control and Planning Department was established, IBM had little overall direction in the internal use of computers. In fact, little coordination took place between divisions; most data processing activities were confined to locations and units within divisions. Consequently, each manufacturing plant and marketing region developed and operated its own system. Although the individual systems carried out similar functions, they differed in design and performance; they could not be used interchangeably and could not communicate with each other. The result was a redundancy of data and excessive use of the data processing resources required to develop and maintain such systems. Even with this large expenditure of resources by each division, the systems were mainly satisfying the local department needs of the business, rather than doing an overall data processing job. When steps were taken to improve the data processing within a division (for example, development of a consolidated order entry system within the marketing division), little serious attention was given to an effective interface of that system with inputs from engineering and outputs to manufacturing. The business was not getting the return on investment from data processing that it could have because the information needs of the business, and particularly those of the general manager responsible for the business, were not being accommodated.

The first effort of the Control and Planning Department was to inventory and profile the systems existing within the business and the plans for the future. At the same time, recognizing that the data processing effort must be directed toward satisfying business needs and not solely toward individual functions and departments, the Control and Planning Department established a set of information system strategies covering five major areas:

1. Fixed data responsibility
2. Single source and parallel distribution of data
3. Central control and planning of information systems
4. Organizational independence of data
5. Resource sharing of data, equipment, and communications

With the knowledge of what was being done with data processing, and the direction established through the set of strategies, the department defined a network of information systems and assigned responsibilities for the development of the systems. These systems addressed the operational, functional, and general management needs for information.

As the definition and design efforts for the business-wide network of information systems got under way in the late 1960s, many of IBM's customers showed interest in learning how they might better manage their information system resources. In an effort to assist these interested customers, IBM established the Business Systems Planning (BSP) program in 1970.

To conduct the program, the nucleus of the control and planning department that developed the internal information systems plan was transferred to the Data Processing Division headquarters. This group proceeded to document proven methodologies and institute a training program to educate regional and branch office personnel and customers in the approach. Executive briefings and seminars were established to show customer executives the potential benefits of the approach and the reasons why their involvement was vital to successful implementation of information systems.

The methods used in developing this information systems plan and the lessons learned have since been used by many IBM customers. Application of BSP methodology has helped them to formulate their information system plans and control mechanisms and to improve their use of information and data processing resources. Studies using the BSP methodology and guidelines have been conducted successfully by profit and nonprofit organizations, of varying size, in many industries.

Objectives and Potential Benefits of BSP

With a reasonable amount of planning and control, the user of this BSP approach should be able to attain its objectives and realize its potential benefits.

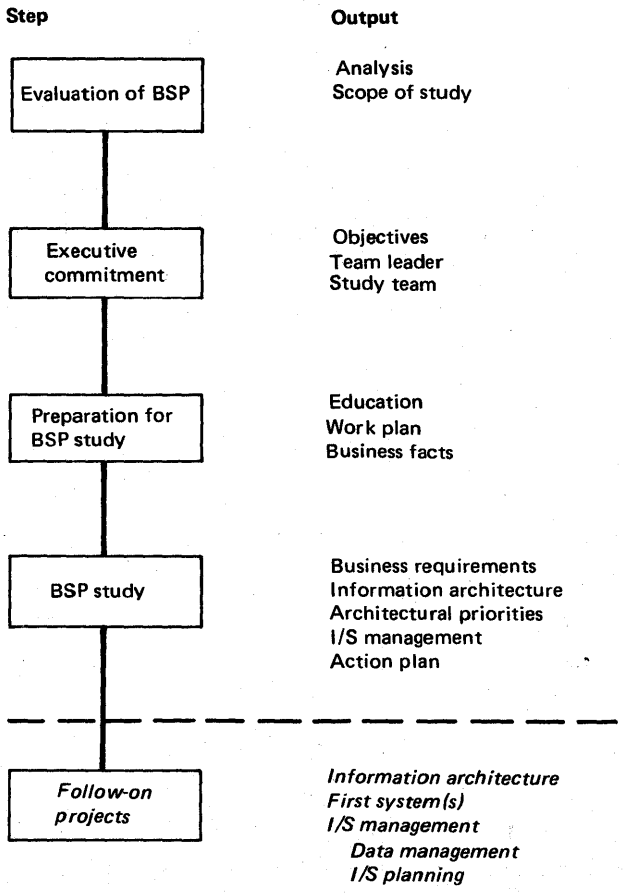
Objectives

The first and most important objective of BSP is to provide an information systems plan that supports the business's short- and long-term information needs and

is integral with the business plan. There are other objectives that help to justify and clarify the approach:

1. Provide a formal, objective method for management to establish information systems priorities without regard to provincial interests.
2. Provide for the development of systems that have a long life, protecting the systems investment, because these systems are based upon the business processes that are generally unaffected by organizational changes.
3. Provide that the data processing resources are managed for the most efficient and effective support of the business goals.
4. Increase executive confidence that high-return, major information systems will be produced.
5. Improve relationships between the information systems department and users by providing for systems that are responsive to user requirements and priorities.
6. Identify data as a corporate resource that should be planned, managed, and controlled in order to be used effectively by everyone.

The illustration below shows the overall flow of BSP and relates the BSP study to the activities that follow. This relationship is expanded upon in Chapter 16, with an explanation of the follow-on activities.



Potential Benefits

Application of the approach and methodology contained in this planning guide offers many potential benefits to three management groups:

To executive management:

- An evaluation of the effectiveness of current information systems
- A defined, logical approach to aid in solving management control problems from a business perspective
- An assessment of future information system needs based on business-related impacts and priorities
- A planned approach that will allow an early return on the company's information systems investment
- Information systems that are relatively independent of organization structure
- Confidence that information system direction and adequate management attention exist to implement the proposed systems

To functional and operational management:

- A defined, logical approach to aid in solving management control and operational control problems
- Consistent data to be used and shared by all users
- Top management involvement to establish organizational objectives and direction, as well as agreed-upon system priorities
- Systems that are management and user oriented rather than data processing oriented

To information systems management:

- Top management communication and awareness
- Agreed-upon system priorities
- A better long-range planning base for data processing resources and funding
- Personnel better trained and more experienced in planning data processing to respond to business needs

The plan that results from a BSP study should not be considered unchangeable; it simply represents the best thinking at a certain point in time. The real value of the BSP approach is that it offers the opportunity to (1) create an environment and an initial plan of action that can enable a business to react to future changes in priorities and direction without radical disruptions in systems design, and (2) define an information system function to continue the planning process.

Chapter 1. BSP Concepts

Business Systems Planning is most often thought of as a structured approach or methodology. This methodology, however, is based upon some fundamental concepts, a good understanding of which can give the BSP study team members:

1. A better appreciation of the "why's" of the methodology
2. Improved confidence in applying variations to meet specific situations
3. A better background with which to communicate the objectives and eventual recommendations to senior management

The premise for conducting a BSP study is that there exists within the organization a need for significantly improved computer-based information systems (I/S) and a need for an overall strategy to attain them. BSP is concerned with how these information systems should be structured, integrated, and implemented over the long term. The basic concepts of BSP can be related to the long-term objectives for I/S in an organization.

An I/S Must Support the Goals and Objectives of the Business

This most basic concept underlies the "top down" philosophy of the methodology as well as several of the specific steps, such as executive interviews and system priorities.

Since information systems can be an integral part of a business and be critical to its overall effectiveness, and because they will continue to represent major investments of time and money, it is essential that they support the organization's true business needs and directly influence its objectives. BSP, then, can be thought of as a vehicle or process to translate business strategy into I/S strategy (see Figure 1).

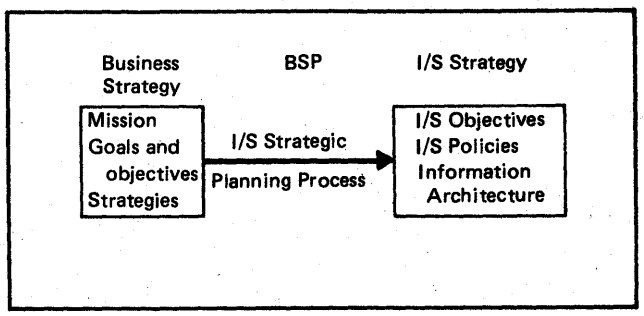


Figure 1. Translation of business strategy to I/S strategy

Obviously, it is important that an organization be willing and able to express its long-term goals and objectives. For some organizations, this can be done principally through the business plan. For others, where a business plan is not available or current, it can be done as a part of the BSP methodology. In either event, a recognition of this basic need by senior management is critical, for only with that recognition will their commitment and involvement be great enough to guarantee a meaningful BSP study.

An I/S Strategy Should Address the Needs of All Levels of Management Within the Business

This requirement has several implications relative to I/S structure. First, it is important to recognize the varying characteristics of information as needed by different activities and management levels. Typically, lower levels need considerable detail, volume, and frequency, higher levels need summaries, "exception" reporting, and inquiries, and still higher levels need cross-functional summaries, special requests, "what if" analyses, "external" requirements, etc. It would be impractical to construct a single system to accommodate all activities or management levels, and it would be erroneous to associate any one type of information requirement solely with one management level. Clearly, there is need to establish some reasonable framework upon which the I/S can be defined.

First, the emphasis in I/S should be in support of management decision making. This is in contrast to more traditional bookkeeping or recordkeeping functions. Business decisions are made for various purposes, but most can be associated with either *planning* or *control.* Planning, of course, is the establishment of various missions, objectives, and policies, and it occurs at all levels. Good information is vital to the establishment of good plans. Control decisions, on the other hand, are made in order to guide an activity toward some implicit or defined (by the plan) objective. The I/S can provide the measurements of the current or actual condition to the decision maker. We thus complete a planning, measurement and control cycle with I/S potentially an integral part. Since planning and control are the keys to decision making, a framework for I/S based upon these activities can be utilized. It has been proposed, * and well accepted today, that three distinct but concurrent planning and control levels exist in any organization:

> *Strategic planning*, the process of deciding on objectives of the organization, on the resources used to attain these objectives, and on the policies that are to govern the acquisition, use, and disposition of resources

*Anthony, R.N. *Planning and Control Systems: A Framework for Analysis*, Harvard Business School, Division of Research, 1965.

Management control, the process by which managers assure that resources are obtained and used efficiently in the accomplishment of the organization's objectives

Operational control, the process of assuring that specific tasks are carried out effectively and efficiently

Further characteristics of these areas are outlined in Figure 2. An advantage of this framework is that it does not restrict planning and control activity to any particular industry, function, or management level. A conclusion at this point is that an I/S could conveniently address itself to any one of the above three planning and control levels.

Resource management is also key to this philosophy and represents a major vehicle for I/S definition. The specific resources to be managed vary in nature and relative importance from one organization to the next. Examples of traditional resources to be managed are people, facilities, materials and money. Their requirements are based upon the needs to support the prime mission area of the organization, e.g., its products or services. Because an organization's product or service area has all the attributes of a resource, i.e., a life cycle of activities and decision points, and yet drives the other resources, it is referred to as the "key resource." Each resource, including the key resource, is managed through planning and control decisions of the three levels previously discussed. Resource management has the desired characteristic of cutting across organizational boundaries – vertically across management levels and horizontally across functional lines. Thus a framework based on resources as well as planning and control levels can be established, and an I/S architecture can be applied within this framework.

An I/S Should Provide Consistency of Information Throughout the Organization

The keyword in this objective is *consistency*. The implication is that information derived from more traditional data processing applications is not necessarily consistent, particularly when applied to new business problems (decision areas) of broader scope. The problems in data consistency normally arise as a result of a historical evolution of computer usage that traditionally occurs. Isolated and independent application areas are selected and mechanized, typically to reduce operational costs. The data files are defined as necessary to support the specific needs of each application without regard to one another or to future applications. The data itself is converted from manual files located and maintained by the using organization.

As computer applications are added, new data files are usually required since the data requirements for different applications are rarely the same. These are usually created from spinoffs of existing mechanized files plus any additional data that may be required from the using area. Summary-type reports for higher management levels are the result of sorting and merging various existing data files together to create new ones. Rarely is any existing data file of the form or content required to provide newly requested information of any magnitude. Thus new data files are born. Data redundancies and file update requirements multiply. The continual cry from management that "I know the data that I need is somewhere in data processing, but I can't get at it" may be basically true from their point of view. The data may be there, but not necessarily defined as needed, of adequate summary level or sequence, or of proper time period or currency.

Decision Characteristic	Planning and Control Level		
	Strategic Planning	**Management Control**	**Operational Control**
Management involvement	General management Functional management	General management Functional management Operational management	Functional management Operational management
Time horizon	Long range (1–10+ years)	Year-to-year Monthly	Day-to-day Weekly
Degree of structure	Unstructured and irregular; each problem different	More structured, cyclic, largely repeating	Highly structured, repetitious
Data requirements	Summaries, estimates, difficult to pre-define, much external to business	Summaries, definable, need for unanticipated forms, largely internal	Detail, operational, definable, internally generated
Resource management	Establishment of policies pertaining to the resource	Allocation of the resource	Efficient use of the resource

Figure 2. Characteristics of planning and control levels

Data, then, exists in most organizations in varying *form, definition,* and *time.* The *form* may be uncaptured raw data, mechanized data files, detailed DP reports, summarized DP reports, business documents, or knowledge in someone's head. The *definition* of any given data can have as many variations, and thus inconsistencies, as there are users of that data. For example, "salary" to the payroll department may mean an employee's actual monthly pay, to the project manager an annual figure plus burden to be charged to a customer, to the department manager a budget line item representing total expense for all reporting employees. In addition, a *time* inconsistency is very likely to exist between what may otherwise be comparable data. Data may be captured by such varying methods as the mail, telephone, data terminals, or satellites. It may be "batched" over varying lengths of time by the user or by DP before processing, or it may be entered "online" as each transaction occurs, directly from its source. Data may be processed daily, weekly, or monthly on a predetermined schedule, or it may be incapable of being processed until a series of prior computer runs are completed (e.g., the month-end closing). The output itself may be mailed or it could be immediately available as the result of an online inquiry. Finally, the report may be up to the second, as when reading from a terminal, or it may have lain in a desk for three weeks after last month's processing. The combinations of time deviations between data capture, data processing activity, and actual data usage are many.

With all these potential data inconsistencies, it is no wonder that reports frequently don't "match" between using departments and managers. This becomes a problem most often during interdepartmental decision-making or at higher reporting levels where consolidation of multifunction activities is important. Attempts to provide better data consistency usually result in "resystematizing" or "consolidating" existing applications into larger ones with broader problem scope and data definitions. This may yield a satisfactory system within the defined scope, but again, as still broader problems are addressed, there will undoubtedly be data inconsistencies between the larger systems. Resystematizing at this scope may be extremely expensive and difficult to justify, let alone accomplish. Comments prevail such as "our systems cannot talk to one another."

What has been described is the classical "bottom up" evolution of data processing systems. In order to begin to address the data consistency problem, a different philosophy must be adopted relative to data management. This is commonly referred to as *managing data as a resource.* This concept suggests that data is of considerable overall value to an organization and should be managed accordingly. It should be potentially available to and shared by the total business unit on a consistent basis. It should not be controlled by a limited organizational segment but by a central coordinator, much like other corporate resources, such as cash and personnel. The management function would include formulating policies and procedures for consistent definition, sourcing, technical implementation, use, and security of the data.

An I/S Should Be Able to Live Through Organizational and Management Change

Many data processing systems and applications are set up to provide the information needs of a specific department or other organizational entity. Others are built solely on the specific output report requirements of a particular manager. Both types can become immediately obsolete upon a reoganization or management change. A new manager may have his own ideas as to what information is needed to run the department. While this kind of change is inevitable, it can be expensive from a data processing standpoint. The data processing system, however, should in no way inhibit management flexibility in a dynamic enterprise. Thus, the I/S must anticipate and be capable of living through the long-term organizational and management changes of a business with minimum impact if the expected return on investments is to be realized.

This objective cannot be realized without the proper support vehicle for I/S, and this vehicle must be independent of the various components of the organizational structure. The BSP vehicle is the *business process,* that is, a basic activity and decision area irrespective of any reporting hierarchy or specific management responsibility. A logical set of these processes can be defined for any type of business and will undergo minimum change as long as the product or service area of the business remains basically the same.

One example of a business process is *purchasing.* A particular business might define this as "the process by which raw materials are acquired from vendors." There may or may not be a separate organizational unit to accomplish this process, or indeed there may be several. Inherent within this process are the various activities and decisions necessary to accomplish the process.

Defining the organization's business processes is one of the most important parts of the BSP methodology, and the method for doing so is tied directly to the previously discussed I/S framework, that is, one based on resources and planning and control levels. With this in mind it is convenient to define an organization's business processes in association with each of its defined resources. Emphasis in BSP is normally placed

upon those processes necessary to manage the ***key resource.*** Each resource of a business can be thought of as having a "life cycle" made up of several stages. A product life cycle, for example, has four stages: requirements, acquisition, stewardship, and retirement. The time spread of the life cycle can vary greatly with the particular product area but is of no consequence in this approach. Business processes can be identified to describe the major activities performed and decisions made by the business in the course of managing the resource throughout its life cycle. These can normally be organized into a process hierarchy, and this is done without regard to organizational involvement or responsibility.

The above approach results in process definitions that encompass the three planning and control levels previously discussed – namely, strategic planning, management control, and operational control. Using a product resource as the example again, the decision to pursue a particular product area would be "strategic planning," the planning and control decisions relative to product volumes or advertising expenditures would be "management control," and the decisions in areas of engineering control, manufacturing efficiency, etc., would be "operational control." By using this approach for all the resources it is possible to define all the business processes that take place within any organizational segment. This may be tempered by practicality in the actual BSP as there may be little I/S support interest for some of the resources.

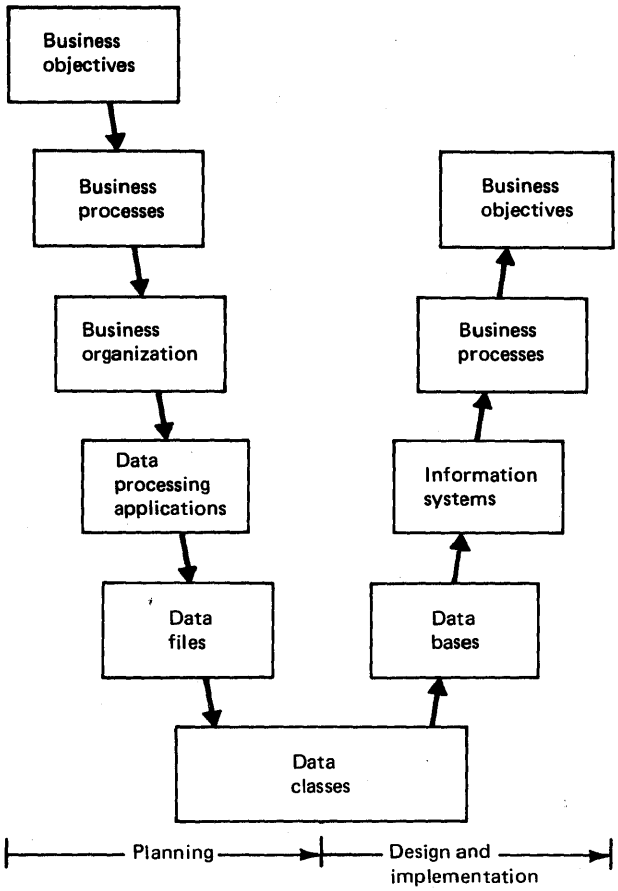


Figure 3. Top-down analysis with bottom-up implementation

The I/S Strategy Should Be Implemented By Subsystem Within a Total Information Architecture

There are several implications and concepts associated with this statement. The first is that a total I/S to support the entire business unit's needs is too big to build in any single project. However, because of the many problems associated with a "bottom up" evolution of systems (data inconsistencies, non-integrated system designs, expensive resystematizing, priority difficulties, etc.), it is very important that long-range goals and objectives for I/S be established. The basic concept, then, is *top-down I/S planning with bottom-up implementation* (Figure 3).

With this concept the long-range I/S goals and objectives are identified through a top-down planning process (the BSP approach). The identified systems are then implemented in a modular building-block fashion over time while remaining consistent with the organization's business priorities, available funds, and other shorter-term considerations. This philosophy can be likened to the detail design and construction of a large office building, which would be unthinkable without an architect's approved drawing of the finished product.

The BSP methodology, although consisting of considerably more steps and detail than shown in Figure 4, is consistent with this philosophy. Step 1 of Figure 4, defining the business objectives, is intended to ensure agreement among all executive levels as to where the business is going, so that the I/S strategy can be in direct support. Step 2, defining the business processes, establishes the prime long-term basis for I/S support in the business. Step 3, defining the data classes, can be done on the basis of the processes to be supported. A *data class*, as the name implies, is a major category of data needed to support one or more business processes. For example, customer information is a data class needed in several process areas, such as order entry, billing, and distribution. This step results in a definition of all the data to be managed as a resource across the business unit. Step 4, defining the information architecture, becomes a statement of the long-term I/S objective. This is normally in the form of a group of interrelated I/S areas and the associated data to be managed. From the information architecture the individual modules can be identified, prioritized, and built as scheduled by the I/S plan.

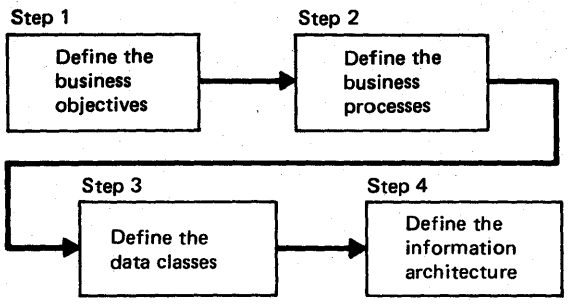


Figure 4. General I/S planning approach

A significant piece of the BSP methodology is the formulation of a recommended information architecture. The intent is to develop an implementation strategy that can be built in modules and yet provide justifiable return to the business at each step. These modules or implementable pieces are generally referred to as information systems (I/S). Each could be thought of as the depository or management point for a particular set of the data classes. As the data classes are implemented (assumed through data base technology), it is possible to provide the information needs for various business processes. Each I/S then normally becomes associated with one or more business processes and one or more data classes (see Figure 5). The implementation strategy should obviously be in tune with the business needs. An identified I/S is responsible for the collection and maintenance of its data bases for the entire business. Other, or later implemented, systems can draw on these data bases as well as new ones that they will create and maintain.

Most of the identified I/S areas will normally be in support of processes that are operational in nature. That is, the decision areas inherent in the processes will relate to the "operational control" level of planning and control. Thus these I/S's are sometimes referred to as *operational control systems.* The managed data is also at an operational level and is typified by much detail and quantity. A *management control system*, on the other hand (Figure 5), is in support of a "management control" category of processes. Its managed data would typically be summarizations of the internally generated operational data (dotted lines in the figure) plus any other data (competitive data, for example) as necessary to support the processes. By having "business plan" data in the data base, the executive could effect control decisions by comparing actual versus plan for his area of responsibility.

In summary, there are a number of basic concepts and philosophies relative to information systems upon which the BSP methodology is based. The methodology itself should be considered flexible in nature. That is, certain steps and techniques could be altered in order to adapt to specific situations without detriment to the final outcome. However, these basic concepts themselves should be considered inviolate. They, in effect, *are* BSP.

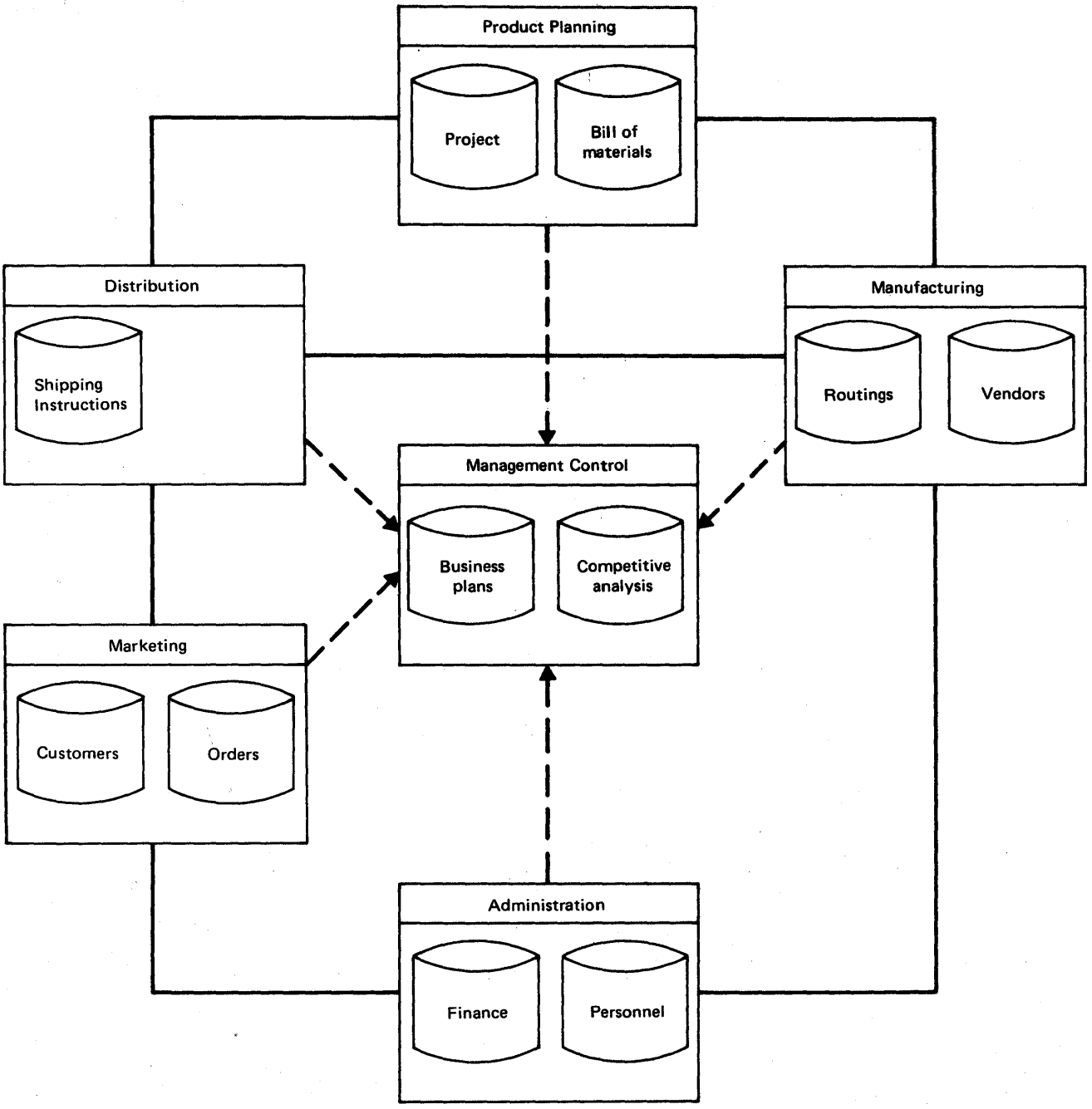


Figure 5. Information architecture example

Chapter 2. Overview of the BSP Study Approach

The keys to success in planning, developing, and implementing an information architecture that effectively supports the business goals are:

- Top-down planning with bottom-up implementation
- Managing data as a corporate resource
- Orientation around business processes
- Use of a proven, comprehensive methodology

Chapter 1 examined the first three at some length. This chapter gives an overview of a proven methodology for the BSP study which will be delineated in more detail in the following chapters.

Perspective

Since BSP is part of an overall cycle for providing the business with required information, it should be put into perspective. As Figure 6 shows, there is a major juncture between identification of overall business requirements and the six project phases for implementing an I/S. Requirements are identified for a total business unit and then separated into projects that are undertaken and implemented over time. In addition to information systems projects, there is also a continuing set of projects covering information architecture and information systems management (ISM). Identification of overall business requirements is not reiterative unless a major change occurs within the business unit that would change the basic business processes.

BSP is a methodology for identifying the business requirements. If an entire business were not included in the BSP study, but only a component such as one profit center, additional BSP studies would be appropriate for other business components.

In the past, and in many businesses today, projects are defined to address a functional area of the business without regard to the total requirements of the business unit. BSP can provide overall direction for the total business before projects are undertaken and therefore avoid the fractionalization of data and inconsistencies of systems.

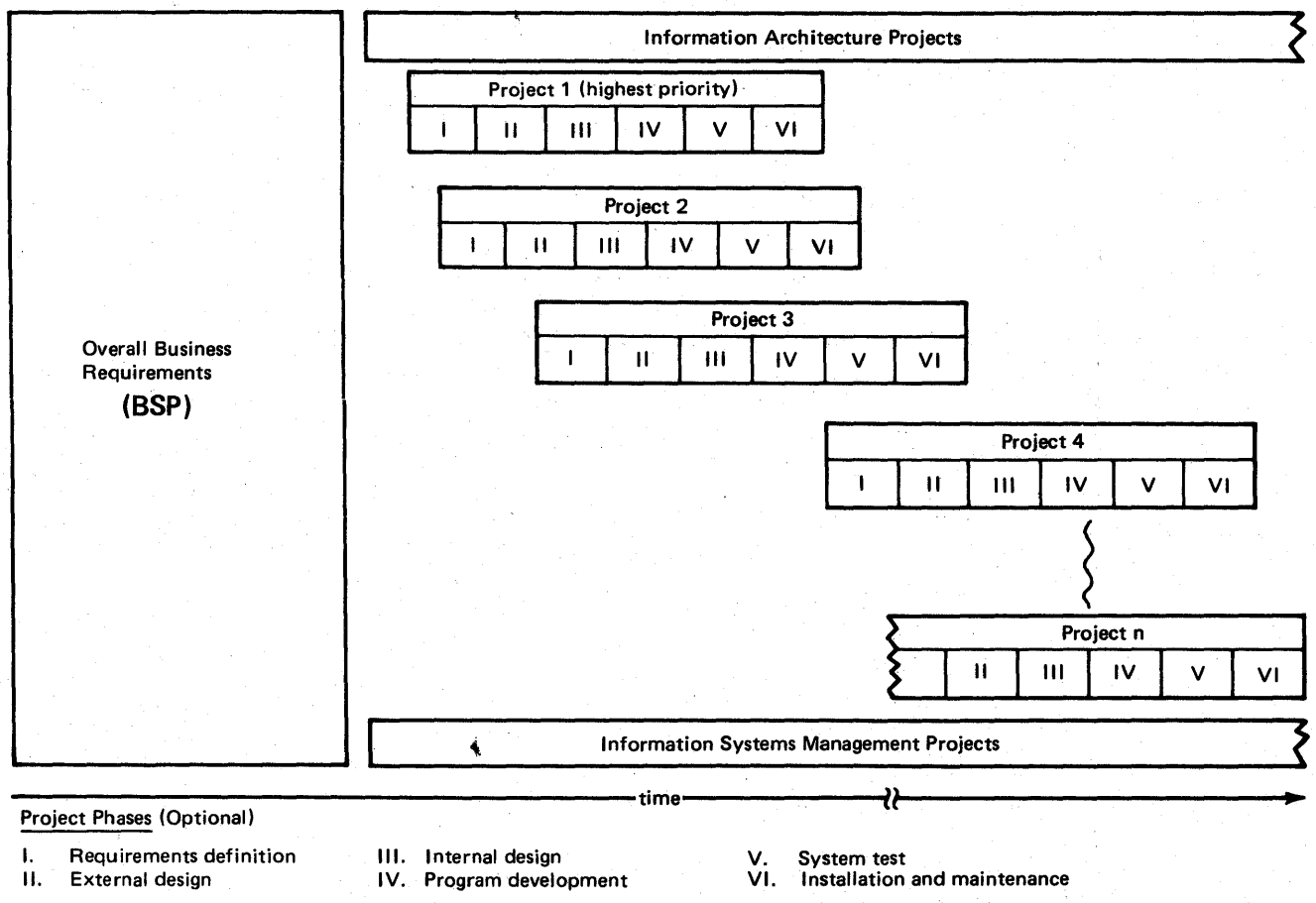
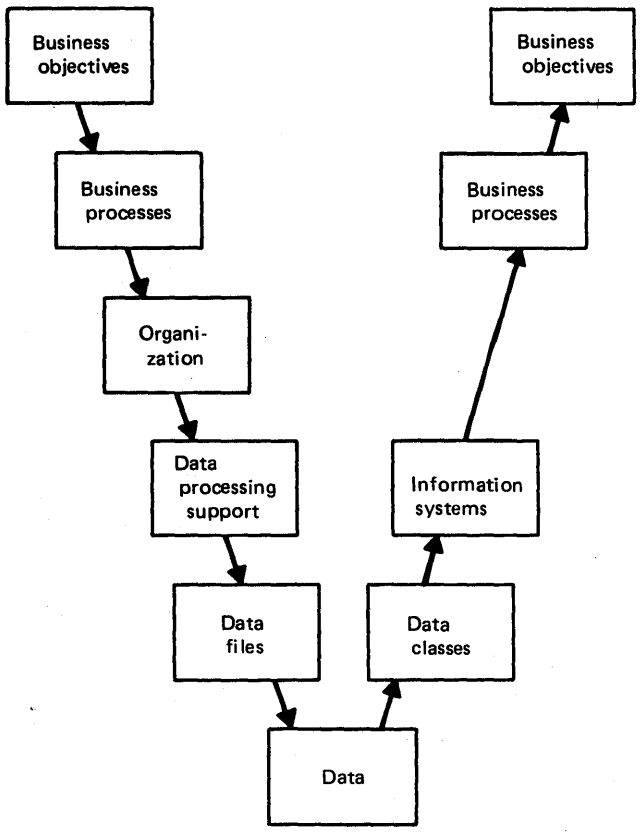


Figure 6. Relationship of BSP to I/S projects

The top-down, bottom-up aspects of the BSP study are reflected in the following:



The study progresses from the very broad world in which the business exists down to the data required to run the business. The data is categorized into data classes that lead to the definition of information systems to support the business processes and business objectives. The study starts with a collection of facts about the business that are usually available in documented form throughout the organization. These facts are organized, abstracted, and analyzed by the study team and enhanced by the top executive, who explains the business and adds those points usually not documented. The study progresses to an identification of the major activities and decision processes in the business and then each of the executives is asked to validate and enlarge upon the facts that have been gathered and analyzed. The analysis ends with the consolidation and comparison of the facts from all sources. From this understanding the study follows the normal path of findings and conclusions, recommendations, action plan, and executive presentation for concurrence and support.

Major Activities

As Figure 7 indicates, there are two major activities that precede a BSP study and eleven in the study itself.

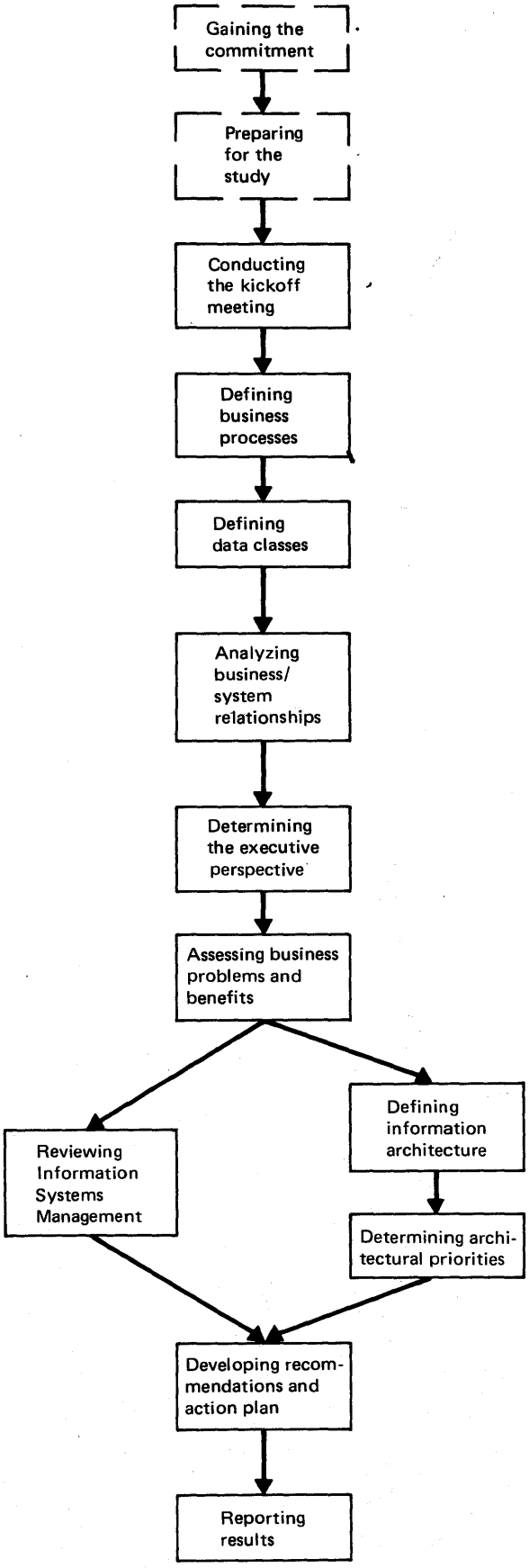


Figure 7. Flow of the BSP study

While these activities may be carried out in varying degrees, none can be omitted. Figure 7 shows these activities and their most logical arrangement. When one becomes fairly familiar with the BSP approach, however, he can, as appropriate, do part of a given activity and delay the balance. The remainder of this chapter is a brief commentary on these major activities.

Gaining Commitment

A BSP study should not be started unless a top executive sponsor and some other executives are committed to being involved in it. The study must reflect their view of the business, and the success of the study depends upon their providing the business understanding and information requirements to the team. Most of the input will come directly or indirectly from these executives.

Since approval of study recommendations commits the company for several years to a certain direction in the use of its data processing resources, it is important at the outset to get agreement on the scope and objectives of the study and on its expected deliverables, so as to minimize future misunderstandings.

The most important action following commitment regards selection of the team leader, an executive who will work full time in the study and direct team activities. He sees that contact with other executives is on the proper level and that input from them is interpreted correctly. A letter from the sponsor to all participating executives sets the tone and signifies commitment.

Preparing for the Study

Considerable saving of time, avoidance of frustation, and higher quality of output can be gained by proper study preparation. All executive participants and the team need to know what will be done, why, and what is expected of them. Proper education and orientation will provide the best input from the executives and the best use of it by the team.

Interviewees are selected as soon as possible so as to allow for their orientation, scheduling of interviews, and the providing of information to the study team. For maximum efficiency on the part of the team in working together full time during the study, information on the company and on data processing support is gathered before the study kickoff.

A control room is established so that the team may work together, display relevant material on the walls, and conduct interviews.

The major output should be a study control book containing: a study work plan; a schedule of interviews and a schedule of checkpoint reviews with the sponsor; an outline of the final report from the BSP study; and business and information systems data, analyzed and charted, and ready for the kickoff period. This activity should end with a review by the BSP study sponsor.

Conducting the Kickoff Meeting

The BSP study itself and the full-time participation of the team members starts with the kickoff meeting, which consists of three presentations. First, the executive sponsor reiterates the objectives, expected outputs, and perspective of the study with relation to other company activities and objectives.

The next presentation is concerned with the main purpose of the kickoff, which is to provide that each team member is conversant with the information that has been gathered and to discuss those facts that are not part of the information supplied. To accomplish this the team leader "walks through" the business facts that have been gathered and makes subjective comments and additions on facts that cannot be readily documented – politics and sensitive issues, and changes planned and in process. He should also cover the decision process, how the organization functions, key people, major problems, the user's view of DP support, and the image of the DP department.

The third presentation is made by the information systems director or one of his managers, who gives the team a view of data processing analogous to what was presented for the business. He should also cover project status and project control, history of major data processing projects started in the last two years, major current activities, planned changes, and major problems.

These three presentations, added to the facts that have been gathered and made readily available to the team, should give the team an overall understanding of the business and the present and planned data processing support.

Defining Business Processes

No other activity during the study can be quite as overwhelming or as important as the identifying of the business processes. Since these processes form the basis for executive interviews, the information architecture, problem analysis, data class identification, and various follow-on activities, everyone on the team must acquire an understanding of all the processes, and they can do so by assisting full time in their identification and in the writing of their descriptions. The major output from this step will be a list of all the processes, a description of each, and the identification of those that are key to the success of the business.

Defining Data Classes

The defining of data classes is the grouping of data into logically related categories. This classification, and its

subsequent modification during the follow-on projects, helps the business develop data bases over time with a minimum of redundancy and in a manner that allows systems to be added without a major revision to the data bases. Since data must be recognized as a corporate resource, it deserves the attention recommended here.

When the data classes have been identified, they are related to the business processes in order to define the information architecture, and they are related to present files to assist in the development of a migration plan.

Analyzing Business/Systems Relationships

The main purpose of this activity is to show how data processing currently supports the business in order to develop recommendations for future action. The currently existing organizations, business processes, information systems (applications), and data files are analyzed to identify voids and redundancies, help clarify responsibilities, and further the understanding of the business processes.

The main analysis tool is the matrix, and various matrices are developed using combinations of the four elements. The key matrix for the executive interviews is the organization/process matrix, and its intercepts denote the decision makers, major and minor organizational responsibility for a process, and current data processing support.

This activity will not only prepare the team for discussion with executives but will also help them determine requirements for information support.

Determining the Executive Perspective

This activity is an integral part of the top-down approach. Its purpose is to validate the work done by the team, determine the objectives, problems, and information needs and their value, and gain executive rapport and involvement. The executive interviews provide the business understanding necessary for information systems planning.

The major output consists of notes from the interviews, an update of the control room charts, and a new or improved rapport between the executive and the BSP study team.

Assessing Business Problems

Some of the business problems were supplied as input during the fact-gathering step. These were expanded upon and complemented by the knowledge of the team and finally validated, explained, and added to in the executive interview. The problems must now be analyzed and related to the business processes so as to give guidance to the setting of project priorities and to show clearly that better information will help to solve the problems.

One of the last activities in assessing the business problems is to divide them into those which are information systems support problems and those which are non I/S problems. The non I/S problems will be delineated and given to the executive sponsor to follow up on while the information systems support problems continue to be addressed in the BSP study and by the follow-on activities.

Defining Information Architecture

This activity represents a major movement from an examination of the present to a synthesis of the future. It is here that we sketch future information systems and their accompanying data.

Systems may be viewed as the automated portions of processes. Data bases are the computerized part of the total inventory of data in the business. Information architecture brings order and structure to the systems and the data they create and use. Once it is structured, it allows for step-by-step development to migrate from the applications of today to the information systems of the future.

Because this task involves drawing a blueprint for the future, it deserves the attention of the whole team.

Determining Architectural Priorities

Since a total information architecture cannot be developed and implemented at one time, the team must establish priorities for the development of the systems and data bases. By deciding which of the data bases should be designed and implemented first, the team establishes which subsystems will be defined during the follow-on project. This allows an early implementation for a "pay-as-you-go" foundation and helps establish credibility for the balance of the output from the BSP study.

Prioritization is accomplished by developing a list of projects from the subsystems of the information architecture, then establishing a set of criteria and rating the prospective projects against them. The analysis of the business problems is a major contributor to this process.

Reviewing Information Systems Management (ISM)

The purpose of ISM is to eventually establish a controlled environment in which the information architecture can be developed, implemented, and operated efficiently and effectively. The information systems functions are examined during the BSP study to identify (1) any changes that could be made immediately to enhance success in the follow-on projects, (2) changes

that are necessary to properly manage and implement the high-priority information architecture projects, and (3) major activities that will become projects in the follow-on to the BSP study. Fulfillment of this step is vital to the successful support of the business by the data processing function.

The major inputs are the information systems support problems from the executive interviews, the ISM problems as identified by the I/S director, and the technologies and skill requirements of the first system or systems. Additions and/or changes to the present information systems functions that are required for planning, developing, and implementing are then identified and put in priority sequence. This forms the basis for the development of an action plan for ISM which feeds into the action plan and report from the BSP study.

Developing Recommendations and Action Plan

The purpose of the action plan is to assist management in its decisions regarding the recommended follow-on projects. The follow-on projects will come from the architectural priorities and from the information systems management recommendations. Each of the projects will have been defined as a result of the activities in those two areas. The action plan brings these together to identify specific resources, schedules, and interactions of the projects.

Another major part of the action plan should be the identification of the steps preparatory to starting each of the follow-on activities. These must be examined and sized before start dates can be put on the follow-on projects, so that management can give the direction necessary to move immediately into those preparatory activities.

Reporting Results

The purpose of the final report and executive presentation is to obtain executive management commitment and involvement for implementing recommendations from the BSP study. The format of the report was agreed upon before the study was started, but may have to be modified slightly now, on the basis of the study results. Various parts of the report should be written during the BSP study and finalized at this time.

The report should be prepared as follows:

1. It should include an executive summary.
2. The supporting detail, such as descriptions of the business processes, should be contained in appendices.
3. It should be possible to extract highly confidential or sensitive material easily and still have the balance of the report usable by all people participating in the follow-on activities.

The report provides the basis for the executive presentation and the distribution of the final results to those people designated by the sponsor. After the executive presentation, which is normally given by the team leader, all other relevant material that is not a part of the report should be indexed and filed for ready availability in follow-on projects.

Chapter 3. Gaining the Commitment

The success of a Business Systems Planning study depends heavily upon the commitment of the business to complete all the relevant activities and heed the recommendations of the study team. The steps described in this chapter should be completed and an assessment made of the commitment of all participants, before the final decision is made to move into the resource dependent activities. Certain situations and environments will be considered unsuitable for a BSP study at this stage. If such is the case, the team should be prepared to postpone BSP until the situation becomes more suitable.

In some organizations there may be a problem in obtaining access to executive management to explain the objectives and expected results of a BSP study. If so, the following actions should be considered:

- Arrange an executive visit to another business that has successfully completed a BSP study
- Invite a senior IBM executive to discuss information systems planning with the appropriate executive in your organization
- Conduct an executive briefing session specifically for your executives
- Conduct an executive planning session – a service offered by IBM
- Invite the executive to an executive information session conducted at an IBM Customer Executive Education center

The IBM representative can help set up any of these activities.

Establishing the Study Scope

Normally the executive sponsoring the study (called the *executive sponsor*) will select the scope of the organization to be studied. This business unit must be defined so that all participants can recognize the boundaries within which their activities will be concentrated.

In general, the selected segment should extend to the upper levels of the organization, include more than one major function, and be of significant importance to the organization in that it contributes a major portion of the revenues, profits and/or services.

Businesses whose activities are participated in by multiple functional units tend to gain more from a BSP study than those that are more simply structured.

Most companies performing a BSP study choose a major operating division, a group of divisions, or the entire organization (see Figure 8, options 1-3 respectively). In each case it should be possible to define

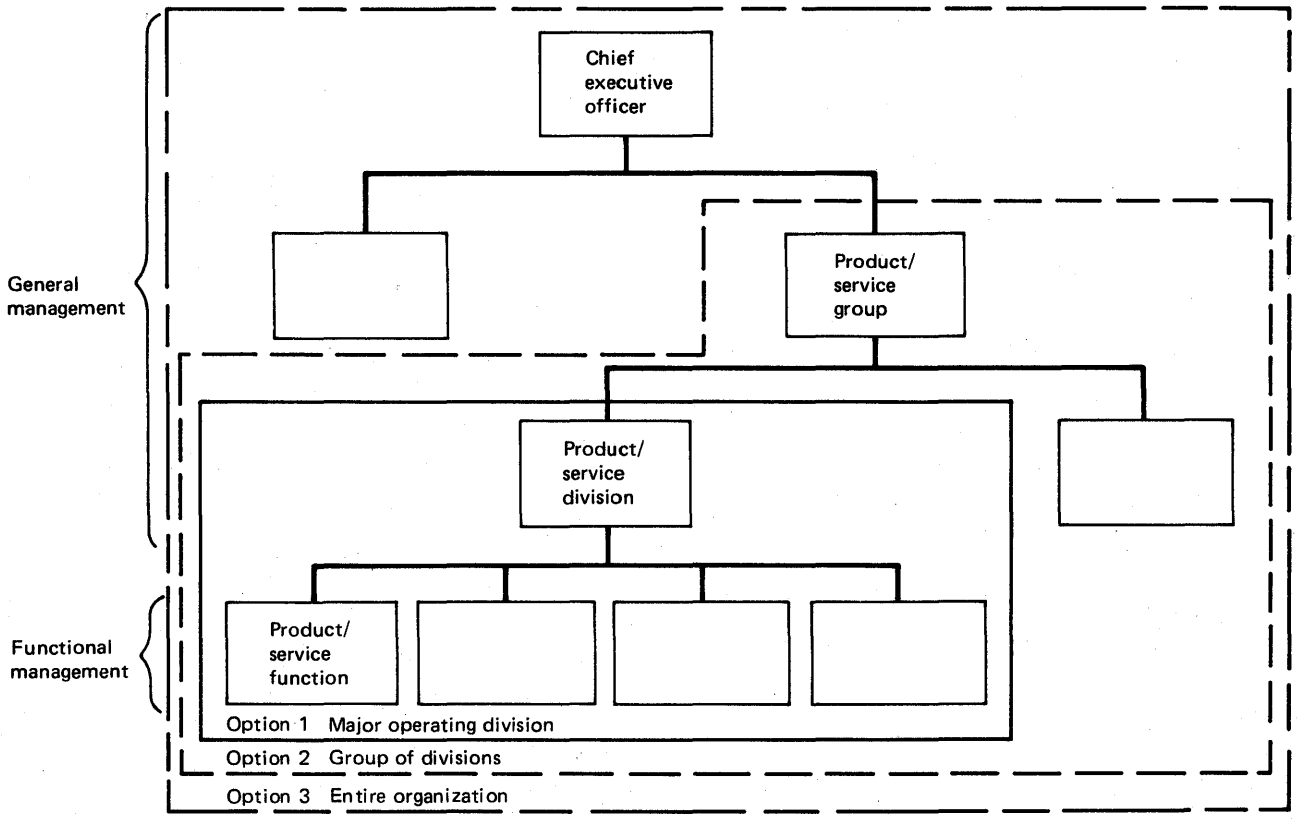


Figure 8. BSP organizational business unit options

boundaries for the study scope, including the measurements for assessing effectiveness.

Setting Study Objectives

Study objectives should now be defined. Good objectives will be capable of being stated clearly and concisely. They will have criteria that can be applied to measure the degree to which they have been met. In addition, they will be applicable to the specific requirements of the organization to be studied. Finally, they will be capable of being satisfied by the BSP study team working within the defined study scope.

Specifically, a study team's objectives may be to:

- Provide a formal, objective method for management to establish information systems priorities without regard for provincial interests
- Provide for the development of information systems that have a long life, protecting the systems investment
- Provide that the data processing resources are managed for the most efficient and effective support of the business goals
- Increase executive confidence that high-return information systems will be produced
- Improve relationship between the information systems department and the users by providing systems responsive to the users' requirements and priorities
- Identify data as a corporate resource that should be planned, managed, and controlled, in order to be used effectively by everyone

Developing Business Reasons for the Study

There are several factors that may make a given business more difficult to do a BSP study for than others:

- Major reorganization or transformation of control taking place
- Geographical diversity, necessitating significant travel time
- Well over 20 executives who must be interviewed
- Multiple independent sub-organizations with autonomous decision making processes and with unique lines of products/services serving diverse markets

These factors should be reflected in a brief report (two or three pages) containing:

- Statement of the study scope
- Study objectives
- Positive contributions of a BSP study
- Obstacles to successful completion
- Recommendation either to proceed with BSP or postpone it

Current participants should present this report to an executive of the organization and gain agreement on all issues. Assuming that the report recommends proceeding with BSP, the meeting should result in a commitment to:

- Appoint a study team leader
- Resource the study team as appropriate
- Have open communication of future plans and current data among all team members
- Write a study announcement letter to executives of the organization of the form shown in Appendix A.

Resourcing the Study Team

Characteristics

Since the study team is responsible for determining the information needs of the entire business and recommending the nature of its data processing operations for years to come, the selection of team members is very important.

The people chosen should:

- Have several years' experience within the organization, a sound knowledge of their own area, and an appreciation of the rest of the business
- Be able to understand and deal analytically with problems
- Be willing to commit to conclusions and recommendations that will have a far-reaching effect on the organization
- Be perceived by other management within the organization as competent and responsible businessmen whose opinions will carry considerable weight

In short, the best people for the study team are those who are already in high demand and difficult to make available.

Organization and Responsibilities

A possible organization structure for the study team is depicted by Figure 9. While minor variations are possible, the following fundamental responsibilities need to be assigned:

- Executive Sponsor
  - Visibly endorse and support the study effort.
  - Review progress and findings during the study.
  - Receive the final report and make the approval decision.
- Team Leader
  - See that the study is successfully completed.
  - Provide overall direction, make key business judgments, and act as liaison with other executives of the organization.
  - Direct the study effort on a day-to-day basis and organize all necessary administration for the team.

- Team Members
  - Participate in at least some, if not all, interviews.
  - Analyze the data collected and executive perspectives expressed during the study.
  - Draw conclusions and perform report writing tasks.
- Team Secretary
  - Do typing, filing and general secretarial services.

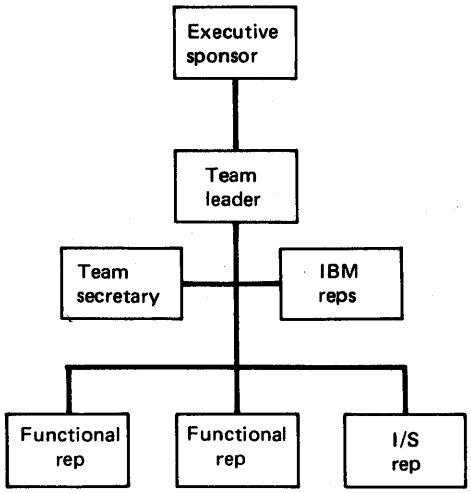


Figure 9. Sample study team organization

Considerations for Full-Time or Part-Time Study

To compound the problem of team selection, a BSP study is intensive in nature, and is best performed on a full-time basis. While part-time studies may appear to be easier to resource and may be successful, they are often characterized by deadline and continuity problems. Before embarking on a part-time study, assurance should be gained that:

- The team will be very well managed. That is, the time, effort and skills required to tightly control the work schedule must be available and committed.
- Momentum will not be lost as a result of inactivity during the study.
- Astute use will be made of the administrative support available to effectively utilize the time when the team is not in session to prepare and type drafts, update charts, etc. One full-time member may be helpful.

Manpower Requirements

If the intent and methodology of BSP are reasonably followed, and the study team is full time, the resources required should fall within the following limits:

- Number of team members 4-7
- Number of weeks 6-8

These wide variations can be explained by significant variations in organizational types and sizes, as well as study objectives.

Selection of Team Leader

The success of the study depends largely on the person selected by the executive sponsor to lead the team. The team leader will be knowledgeable in business matters and have a broad perspective of the business. With first-hand knowledge of how the various departments of the business interact, and where detailed information about the operation of the business can be obtained, the leader can save the team valuable time.

Activities of the team leader include:

- Conducting the study team orientation session
- Conducting a kickoff meeting for team members at the outset of the formal activities of the BSP study
- Setting and confirming executive session schedules
- Managing the logistics of the study, including day-to-day administration
- Providing guidance and business perspective
- Providing resource material
- Maintaining the schedule
- Presenting the study report to management at the completion of the study

Sponsor's Letter

The team leader is now in a position to compose a study announcement letter to be signed by the chief executive officer and distributed to the executives who control the major functions within the scope of the study. The letters should cover:

- Objectives of the program
- Potential value to the organization
- Need for functional executives to be involved
- Need for candor and cooperation of executives

A sample announcement letter is included in Appendix A.

Chapter 4. Preparing for the Study

Using the criteria established in Chapter 3, potential team members are identified. Final selection is normally performed by the team leader and the executive sponsor. The information systems representative on the study team will provide continuity for the activities that will follow the BSP study. Each team member must be thoroughly briefed on the magnitude and importance of the study and on the executive sponsor commitment to BSP.

A preparation plan will be prepared by the team leader with assistance from IBM personnel. The major tasks are:

- Briefing the study team
- Gathering data on the business and information systems
- Educating team members
- Developing the study work plan
- Defining the study report and ancillary output
- Creating an executive interview list and schedule
- Briefing participating executives
- Obtaining a suitable control room
- Arranging for administrative support
- Reviewing with executive sponsor

These tasks, many of which can be performed concurrently, are described in the remainder of this chapter.

Briefing the Study Team

The team leader, assisted by experienced IBM people, should hold a half- to full-day orientation session to brief the study team on such topics as:

- Overview of BSP. This can include development of the BSP concept, study methods used, output that may be expected, and references to results obtained in other BSP studies.
- Review of activities to date. The team leader presents the scope of the study, states its objectives, and leads a discussion of the business reasons for conducting the BSP studies at this time.
- Study preparation plan and schedule. Generally the team leader will have prepared a draft plan and schedule. After this has been presented, the team, operating as a working committee, should critically review the plan.

The leader should also discuss with team members the allocation of the preparation activities. As a work group, the team should divide the activities among themselves. In general, distribution of the workload among the various team members depends on how much time they can devote and how closely the tasks relate to their respective functions.

Gathering Data

To provide a basis of information the team should establish a reference library of both business and information systems documentation. Data of value will be of two types:

General Business

- Environment
  External – economic, customers, technology, competition, government, suppliers
  Internal – corporate policies, practices, constraints
- Industry position and industry trends
- Planning process and calendar
- Business plan – goals, objectives, strategy, resources, schedules, financial
- Organization charts – position, names, numbers of people, and expected changes
- Key decision makers
- Major business measurements and control
- Major studies, task forces, committees during the previous three years
- Major problem areas
- Products and markets
- Geographic distribution
- Financial statistics
- Sizing statistics (vendors, employees, orders, customers, shipments, purchase orders, etc.)
- Project initiation and funding process

Information Systems

- I/S plan – goals, objectives, strategies, resources, schedules, finances
- Policies and practices
- Organization charts
- Planning process
- Major studies, task forces, committees during previous three years
- Geographical distribution (equipment, terminals, communication facilities)
- Software environment
- Project initiation and funding process
- Systems justification requirements
- Standards/guidelines
- History of major projects started in the last two years
- Present and planned systems and data bases
- Major information systems problems
- Sizing statistics (number of programs, jobs per period, users, files, data elements, and turnover)

Educating the Team

To enable a smooth, coordinated entry to the BSP study, the team members should understand the principles of the BSP methodology. Some understanding of the method of implementation, plus a review of the nature of the output that can be expected, will also be of advantage to the team members.

The team leader, working with IBM personnel, should establish an education plan for the team. Formal IBM education is available and the local IBM office can supply details.

It is recommended that all team members should attend the same education session.

Developing the Study Work Plan

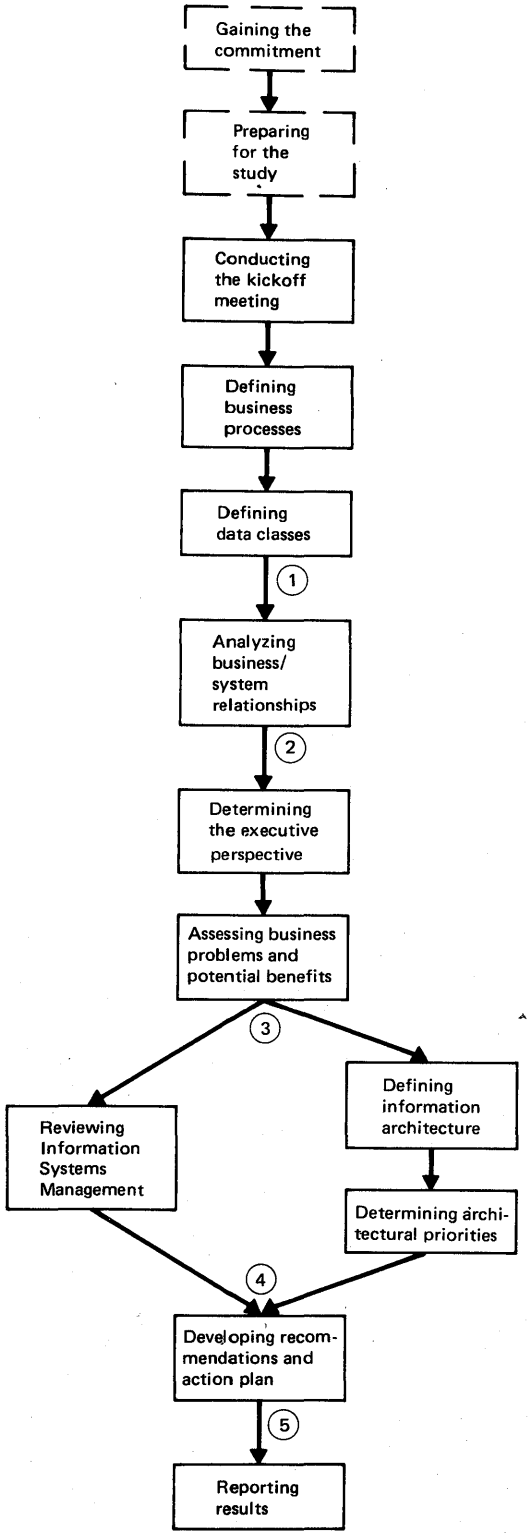
Intensive study activity requires appropriate planning and assignment of tasks. A work plan will document all the known tasks and indicate major resource allocation required to complete the study. The team, working under the guidance of the team leader, should develop a study work plan in keeping with the scope and objectives previously established.

There are some study control points that should be scheduled in the work plan (e.g., see Figure 10). The team should consider whether additional control points should be established in each particular study.

When the activity and project control checkpoints have been established, they should be combined into a single action plan. This plan can be represented on a Gantt chart similar to that shown in Figure 11. This plan is developed under the control of the team leader, and agreed upon by the team members.

Control Point	Participants	Activities
①	Study team	Review study to date, documentation standards, and team understanding of results. Confirm resource allocations for the next stage.
②	Executive sponsor	Results to date. Update the study plan. Review the executive interview objectives.
③	Executive sponsor	Report on both qualitative and quantitative results of the executive interviews. Present and validate the assessment of business problems and benefits. Update the study plan.
④	Study team	Team agreement on all major issues. Review all supporting documentation to be completed. Confirm resource allocation. Update the plan.
⑤	Executive sponsor	Review all major findings and recommendations. Demonstrate an understanding of the business and its requirements. Gain executive sponsor's agreement that the team is qualified to present the recommendations.

Figure 10. BSP study control points



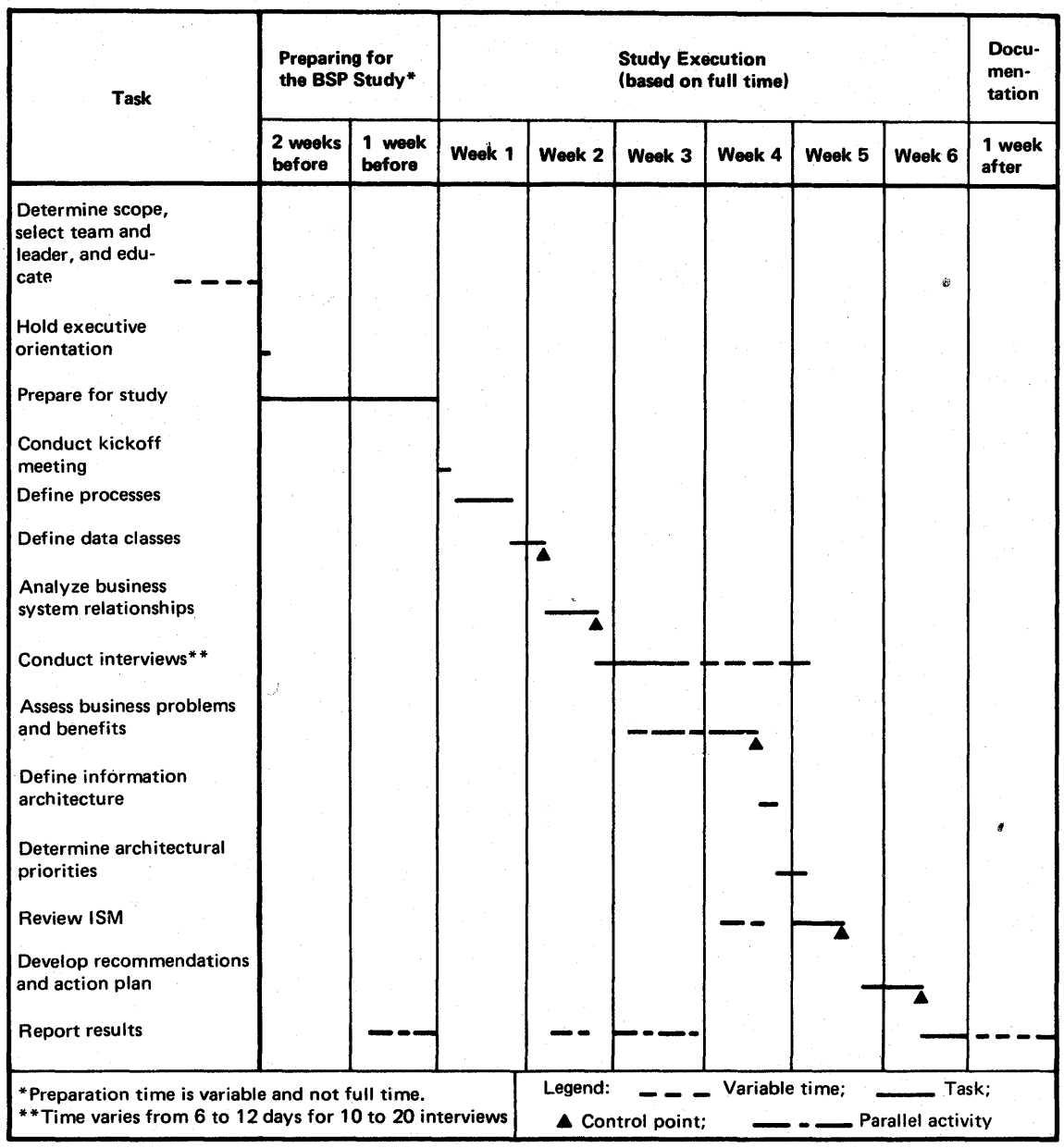


Figure 11. Work plan for the BSP study

Establishing a BSP Study Control File

The control file should be established to contain all material pertaining to the study. Because of the nature and number of the documents involved, they should be stored in a lockable filing cabinet. Suggested contents include:

- Key correspondence
- Statements of objectives and scope
- Project plan
- Schedules
- Data gathered during preparation
- Documentation of completed analyses
- Executive interview notes
- Executive interview summaries
- Project control review meeting notes
- Recommendations
- Report and presentation

Defining the Structure of the Final Study Report and Ancillary Output

The outline (and table of contents) should be established as early as possible. Team members should be assigned specific responsibility for sections of the report. During the study period, it is the assigned member's duty to coordinate and deliver their section.

A typical Study Report will contain the following topics:

- Executive summary
- Purpose, scope and objectives
- Method of study
- Business perspective
- I/S perspective
- Findings and conclusions
- Recommendations
- Action plan for follow-on projects
- Appendices as required

Because of the nature of a BSP study, documentation created during the study may prove valuable to functions within the business. While the data and analyses are current, the team should endeavor to publish these documents as ancillary output to the formal report.

Creating Executive Interview List and Schedule

A preliminary list of executives to be interviewed should be prepared as early as possible. The executives selected will normally be within the top three levels of the company and be responsible for the major functions included within the study scope statement. Executives with cross-company responsibilities should also be considered. Since the need is for a perspective rather than specific detailed information, the ideal candidate is the senior executive with discrete functional responsibility, e.g., director of finance, manager of production planning, director of marketing operations.

The tentative executive list and schedule should be prepared by the team leader. Some other names may be added to the list during the study as the team gains knowledge of the company's processes. When creating the schedule, the team leader should consider all factors that may inhibit the full participation of the executives – vacation, important business meetings, public holidays, etc.

The list of proposed executive participants should be reviewed and approved by the executive sponsor. Additions or deletions should be made and the support of the executive sponsor reemphasized.

To enable the executives to prepare for the interview, an invitation letter should be sent at least one week before the interview. The letter should also confirm the time and place for the interview. Reference to the study announcement letter previously signed by the chief executive officer should emphasize the importance of executive participation in the study (see Appendix B). Either within the body of the invitation letter or as an attachment, a list of topics for discussion during the interview should be included. Both the executive and the team members should use this topical outline to make the discussions more fruitful. Possible topics include:

- Responsibilities
- Objectives and plans to achieve required results
- Business problems and value of solving them
- Opportunities for improvement
- Major measurements and controls
- Identification of the key business areas
- Anticipated changes (products, organization, etc.)
- Evaluation of current I/S support
- Requirements for future I/S support
- Value of the required I/S support

Briefing Interviewees

The selected executives should attend a briefing session prior to the commencement of the executive perspective segment of the BSP study. During this preparation phase, the executive briefing session should be prepared, presenters selected and exhibits prepared, so that the session may be delivered at the appropriate time during the study activities.

Major topics which should be included in the briefing are:

- Executive level overview of BSP
- Study scope
- Objectives of the study
- Business reasons for conducting the study
- Review of the expected output
- Executive involvement – why, and what is expected of the executive
- Schedule for executive interviews

Obtaining and Equipping Control Room

Effectiveness of the BSP study depends on having a workroom assigned for its duration. This room is used both as the work location for the team and for executive discussion session away from the executive's office. This approach has proved very effective in allowing executives to review charts and diagrams on display and to concentrate on discussions without interruption.

The study room should be:

- Located away from traffic and noise
- Large enough to accommodate the study team plus one or two other people
- Equipped with a large table, blackboard, flipchart stand, and lockable storage or filing cabinet
- Able to accommodate the posting of charts on the walls
- Securable to protect sensitive information
- Equipped with a telephone only if the telephone can be disconnected during executive interviews

Arranging for Administrative Support

Typing and general administrative support will be required by the study team. This support should be estimated and organized before the major study activities are undertaken. Administrative activities will be concentrated toward the latter part of the study and will include executive discussion summaries, work plans, status reports, results of analyses, charts, final report, confirmation of interviews, and general secretarial support.

Reviewing with Executive Sponsor

Completion of the study preparation is indicated by a successful review meeting with the executive sponsor. Any issues that may have arisen during the preparation should have been resolved by this time.

Items to be reviewed with executive sponsor are:

- General results of the preparation
- Study work plan
- Definition of the study output
- Approval process
- Executive selection and discussion schedule
- Letter of invitation to be sent to selected executives

Everything is now prepared for the start of the BSP study. Experience has shown that if all the items discussed in Chapters 3 and 4 have been completed, the study results should be of high quality.

Chapter 5. Conducting the Kickoff Meeting

Conducting the kickoff meeting is the first major activity in the formal execution of a BSP study. This, and the next five major activities (see Chapters 6-10) are all aimed at understanding the business requirements and data processing support as it exists today as well as business requirements for the future. Since this understanding is vital to the success of the study, all these activities must be carried out conscientiously.

Sponsor's Opening

The kickoff meeting should be attended by all study team members. The executive sponsor opens the meeting, emphasizes the business reasons for initiating the study, and explains the significance of this high-priority program to the company. The sponsor may also reiterate the objectives and scope of the study and expected output, and offer personal commitment and support in the interest of seeing a successful completion to the study.

Review of Study Work Plan

The study team leader reviews the work plan and the Gantt chart or calendar developed during the study preparation phase. The work plan is used as a point of departure for discussing and finalizing:

- Major events, major outputs, and schedules
- Individual assignments
- Project control

This review can also serve as an opportunity to discuss administrative details, such as secretarial support, handling of phone messages, working hours, office security, expense charge numbers, etc.

Business Review

The team leader should be prepared to present, in summary form, the business related information gathered during the study preparation phase. This information may be new to most team members and should serve to broaden the business perspective of the team as a whole.

Presentation emphasis should be given to business goals, objectives and strategies; business problems; organizations; geography; environment; and to information relative to understanding the major resources of the business – cash, people, facilities, materials, and products/services.

Some of the material presented will be continually focused upon throughout the study. This selected information should be posted in the control room. The team leader may also elect to distribute hard-copy handouts to each team member for their own personal review and/or research. In any case, all presentation material, including detail backup, should remain in the control room for continued reference. Much of it will be placed in the Study Control File.

Information Systems Review

The director of I/S, or the team member representing I/S, should present, in summary form, the material gathered during study preparation. This will enable the study team to understand how I/S is currently supporting the business and planning to support it in the future.

The major projects installed or being developed should be discussed with the study team. The discussion should include whether these projects have met or will meet their objectives.

Another area that should be discussed is how data processing interfaces with its users, the responsibility it has in the development and justification of applications, and who has responsibility for data within the company.

A copy of the presentation should be made available to the study team members, as it will help them later in the study – especially during the interviewing and when the team members are developing their conclusions and recommendations.

The following is an outline for presentation of the I/S function:

- Mission and objectives
- History and background of data processing
- Organizations
- Overview of major application systems installed and planned
- Relationship with users
- Project approval process
- Key problems and challenges

Chapter 6. Defining Business Processes

For purposes of the BSP study, business processes are defined as *groups of logically related decisions and activities required to manage the resources of the business.* They are studied and identified without regard to the organization responsible for them. The reason for defining the processes is that doing so will provide or lead to:

- Information systems with a large degree of independence from organization changes
- A comprehensive understanding of how the business accomplishes its overall missions and objectives
- A basis for separating the strategic planning and management control processes from operational control processes
- A basis for defining required information architecture, determining its scope, defining it so as to make it modular, and setting priorities for its development
- A basis for defining *key* data requirements

Lists of processes, along with some sample descriptions from both the public and private sectors, may be found in the appendices.

Prerequisites to Defining Processes

The following points are particularly relevant to success:

- All members must be present and participate throughout the exercise and there should be general agreement on the expected outputs before the exercise begins.
- Note-takers should be designated right from the beginning so that decisions and definitions of processes will not be forgotten or misunderstood later.
- Information gathered before the start of the BSP must describe and size the products and resources, and clearly state or provide a flow diagram of the strategic planning and management control procedures and schedules.
- The team must understand the concept of resources and their life cycle.

The Product and Resource Life Cycle

The manager's job is to manage the resources within his realm of responsibilities to most efficiently and effectively support the goals of the total business. By identifying the decision processes that he goes through and the activities that he performs in managing the resources, it is possible to gain a comprehensive understanding of all the business processes involved. The products/services may be defined as key resources and occupy a major role in defining the business processes.

A four-stage life cycle of the product/service and of each of the supporting resources is used to logically identify and group the processes. The life cycle normally used is:

- Stage 1 – Requirements, planning, measurement and control
- Stage 2 – Acquisition or implementation
- Stage 3 – Stewardship
- Stage 4 – Retirement or disposition

The following paragraphs refer to these stages as requirements, acquisition, stewardship, and retirement.

A description of each of the life cycle stages follows:

1. *Requirements* – activities that determine how much of the product or resource is required, the plan for getting it, and measurement and control against the plan.
2. *Acquisition* – activities performed to develop a product or service or to get the resources that are going to be used in its development. In manufacturing this would include procurement and fabrication; in personnel, the hiring or transfer of people; in education, the development of a curriculum and the enrollment of students.
3. *Stewardship* – activities to form, refine, modify or maintain the supporting resources and to store or track the product/service. In the insurance industry this could be policy maintenance, premium notices and dividend statements; in the distribution industry it could include inventory control and warehousing.
4. *Retirement* – those activities and decisions that terminate the responsibility of an organization for a product or service or signal the end use of a resource. This might include the selling of space on an airline, the discharge or retiring of an employee, the scrapping or selling of a capital asset, or the removal of a service by a government agency.

The life cycle serves as a vehicle for structured, logical, comprehensive identification of the processes by the team.

Basic Steps in Defining Processes

An overview of process identification is provided by Figure 12, which shows the three main sources for the identification of the business processes: planning and control; product/service; and supporting resources. Taking the latter two through their life cycle provides a definition of their respective business processes. Because strategic planning and some of management control are not solely product or resource oriented, they must be considered as a separate source to provide that all processes of the business are identified.

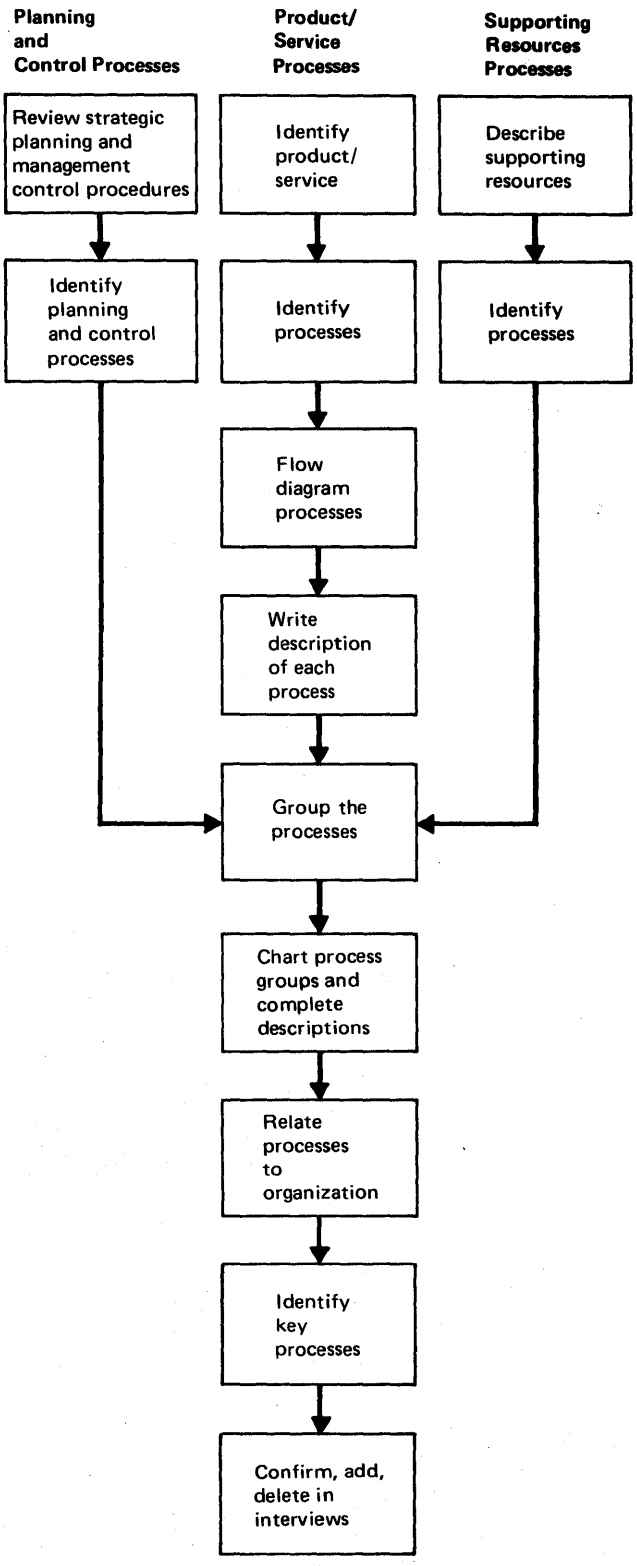


Figure 12. Definition of business processes

After the product and each of the supporting resources have been taken through their respective life cycles and the processes identified and subsequently grouped, it is no longer necessary to retain the process/stage relationship for process defining, but it will be helpful later in identifying data classes. Since the life cycle is an artificial means for directing the team's thinking, very little time should be spent in deciding in which stage a given activity appears. The recording of the activity is more important than its position.

The measurement and control processes identified under the requirements stage will contain both management control and operational control activities. If the processes associated with strategic planning and management control are identified first, it will sharpen the distinction between management control and operational control and reduce some of the redundancy in the management control processes. The following descriptions of steps correspond to the flow presented in Figure 12.

Planning and Control Processes

Define the Processes of Strategic Planning and Management Control

With the preparatory work that was done in collecting the information on planning and possible samples of the organization's plans, it should not be difficult to identify the processes involved. They will normally be grouped into strategic planning and management control. Strategic planning may be referred to as the long-range plan, the seven-year plan, or the development plan. Management control may be referred to as the operating plan, the management plan, the resource plan, and sometimes the contract plan. In some companies the budget may serve as a major tool for management planning and control. Examples of planning and control processes are shown in the following table. Further examples are contained in Appendix D.

Strategic Planning	Management Control
Economic forecasting	Market/product forecasting
Organization planning	Working capital planning
Policy development	Staff level planning
Divestiture/acquisition	Operational planning
Analysis	
Assumptions management	Budgeting
Goals development	Measurement and review
Product line modeling	

For a detailed discussion of the theory of strategic planning and management control the reader may wish to refer to Robert N. Anthony's book entitled "Planning and Control Systems: A Framework for Analysis."

Product/Service Processes

Identify the Product/Service of the Organization

For purposes of this exercise it is assumed that there is one major product group or that the products are managed through similar business processes. In the case of the public sector and some service organizations it will help to go back to the goals to best specify the product or service. For example, one might think that the product of a health insurance organization would be its policies, but an examination of its goals might show the products to be (1) service to the subscriber and (2) payment to the provider. In like manner, an examination of the goals might keep one from assuming that the curriculum is the major product of a university.

If there are two or more groups or families of products and services, they are discussed under "Expansions and Variations" at the end of this chapter.

Identify the Processes in Each Stage of the Life Cycle of the Product/Service

The general approach in identifying the processes is to start with the requirements stage and work through the succeeding stages. Care should be exercised in getting consistency in the level of the processes identified in each of the stages. Although there is no prescribed number of processes appearing in each of the stages, most studies result in only 20-60 processes for the whole business. The team should tend to identify more processes than necessary, with the idea of grouping them later as necessary.

With the total team working together it is sometimes helpful to label each of four charts with the four stages and to complete them simultaneously as each process is brought into discussion. This eliminates the development of notes for the inclusion of certain items in other stages as they are worked upon. There is no secret formula for this identifying of business processes, so one should not be surprised if the first attempt results in many more processes than are needed and also a great inconsistency in the levels. Do not let this deter you; it will be corrected during the grouping of processes.

It is very important that every team member participate at all times, since business processes are the basis for practically everything that follows in the BSP study. Getting started is far more important than any theoretical discussions on the definition of a process group or a process, logic, theory, or other diversions.

The following example might result from performing this analysis with a manufacturer of electrical and electronic components.

Requirements	Acquisition	Stewardship	Retirement
Marketing planning	Engineering design and development	Inventory control	Selling
Marketing research	Product specifications	Receiving	Order servicing
Forecasting	Engineering records	Quality control	Shipping
Pricing	Production scheduling	Packing and storing	Fleet management
Material requirements	Production operations		
Capacity planning	Purchasing		

Make a General Flowchart of the Product/Service Processes

A flowchart of the product/service processes (see Figure 13) serves several purposes:

1. It helps in providing that all the processes have been identified.
2. It helps in determining if the team really understands the business processes associated with the product/service.
3. It serves as a model for the subsequent definition of the information architecture.
4. It helps in identifying the processes involved in managing the supporting resources.

There should be a box on the flowchart for each of the processes. If other boxes seem to be required, the definition of the processes should be reexamined. The flowchart will result from the identification of the above processes and is not intended to show the strategic planning and management control processes.

Write a Description of Each Process

A member of the team should have been making notes on the decisions and activities associated with each of the processes as they were defined by the group. Although this is a laborious task, it is absolutely mandatory if the process descriptions are going to reflect the knowledge of the team and the amount of time that has been spent in defining them. The note-taking job can be rotated through the team and not be a burden on any one individual. The descriptions may be either in list form or verbal.

Completing these descriptions before moving into the next step will help bring out the similarities and differences between these processes and those subse-

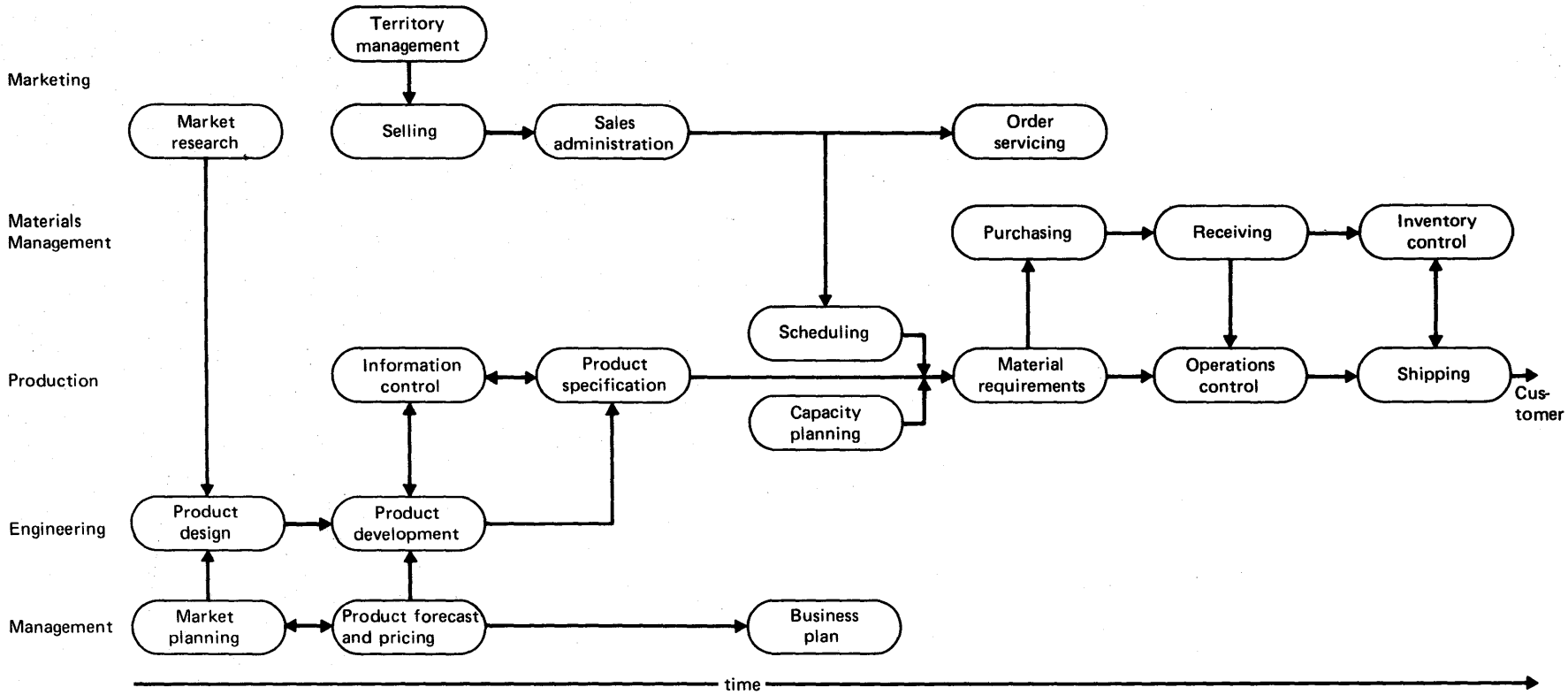


Figure 13. Example of the flow of a product/service through a business

quently identified. One of the advantages of rotating the note-taking among the different members is that the task of further defining the processes can now be assigned to most of the team members so that it may be accomplished before a description of the supporting resources is started. The final revision of these descriptions will probably be included in the appendix to the final report upon completion of the BSP study.

The following are examples of process descriptions (further descriptions may be found in Appendix E):

Production planning – the activity of planning for and coordinating materials, men and machines in order to produce the finished products needed to meet forecasted requirements

- *Capacities and capabilities planning* – the process of balancing production need with ability
- *Scheduling* – the scheduling of labor and material needs to meet production and shipping requirements. Also, the scheduling and balancing of the product mix
- *Material requirements* – the calculation of raw material needs to meet a schedule, recognizing optimum inventory levels, economic order quantities, substitutions, etc.
- *Costing* – establishing of standard raw material costs and product costs on the basis of these and other manufacturing and administrative cost factors

Purchasing – the activities of acquiring materials, machinery and supplies of specified quality on a timely basis at the best price

- *Supplier evaluation and selection* – the searching for, evaluation of, and selection of suppliers who meet requirements for materials, packaging, machinery, equipment and delivery at competitive prices (includes internal search)
- *Order placement and follow-up* – the actual placing of purchase orders with approved suppliers for quantities of raw materials as specified (may include raw material routing) by production planning, equipment acquisitions approved by management, etc. (includes release of customer-purchased materials)
- *Receipts and inspection* – the receiving or returning of purchased materials, machinery, and supplies, verifying quantity and quality, and documenting the activities

Supporting Resource Processes

Describe the Supporting Resources

A resource is best described as *that which a business consumes or uses in meeting its goals.* There are four basic resources that we deal with:

- Materials
- Money
- Facilities
- Personnel

While the use of only these four resources should be adequate, the inclusion of some ancillary resources might make it easier for the team to get a comprehensive list of processes. Selection can be made from the following list:

- Marketplace (general public, potential customers, and customers)
- Vendors
- Documented knowledge (designs, specifications, text material, procedures, patents)
- Company image (in the stock market, to the general public, customers, vendors, employees)

A thorough examination of the activities and decisions associated with these resources should result in the identification of the rest of the operational control processes in which the business engages and which were not brought out in the product/services processes.

The team should review the facts on resources that were gathered and prepared during the preparation for the BSP study. Before starting to identify the processes, it is well to place a chart on the wall with a short description or list of the components of the resource being considered.

Identify the Processes in Each Stage of the Life Cycle of Each of the Supporting Resources

The resources are taken one at a time through the four stages in the same manner as the product/service. The following chart is an example of the processes that might be associated with the resources.

	Life Cycle Stages			
Resource	**Requirements**	**Acquisition**	**Stewardship**	**Retirement**
Money	Financial planning Cost control	Capital acquisition Receivables	Portfolio management Banking General accounting	Accounts payable
Personnel	Manpower planning Salary administration	Recruiting Transfers	Compensation and benefits Career development	Termination Retirement
Material	Requirements generation	Purchasing Receiving	Inventory control	Order control Movements
Facilities	Capital equipment planning	Equipment purchase Buildings management	Machine maintenance Furniture and fixtures	Equipment disposition

Consolidation and Analysis

Group the Processes

The processes have been identified from the three sources: strategic planning and management control; major product/service; and supporting resources. The grouping should take place along the following lines:

- Reduce inconsistencies in level. In the above examples of the processes, the process of manufacturing and the process of accounts payable appear at the same level. This should be corrected.
- Combine the processes where commonalities occur. As an example, purchasing may have been identified as a process in the acquisition stage, not only for the product but also for materials and for facilities. Assuming the processes are similar, these should be combined into one process. As the processes were grouped during the requirements stage, there may have appeared processes entitled manpower loading, develop workflow plan, and schedule supply materials. These three might be grouped with the management control process of operational planning.

A workable maximum is 60 processes. There will normally be 4-12 process groups. Some will be associated with the resources from which they were derived.

Marketing	**Facilities Management**
Planning	Workflow layout
Research	Maintenance
Forecasting	Equipment performance
Sales Operations	**Administration**
Territory management	General accounting
Selling	Cost planning
Administration	Budget accounting
Order servicing	
Engineering	**Finance**
Design and development	Financial planning
Product specification maintenance	Capital acquisition
Information control	Funds management
Production	**Human Resources**
Scheduling	Personnel planning
Capacity planning	Recruiting/development
Material requirements	Compensation
Operations	
Materials Management	**Management**
Purchasing	Business planning
Receiving	Organization analysis
Inventory control	Review and control
Shipping	Risk management

Figure 14. Sample list of processes by process group

The product/service may result in two or more groups, and planning will account for one or two groups. Figure 14 is an example of grouping. Other examples are shown in Appendix C.

Chart the Process Groups and Complete Descriptions

Each process group and its processes should be listed on a chart and displayed for the whole team to view. The team should agree on the placement of each process under the process group, as well as the name of each, and should have a good understanding of all of them. The list should be divided among the team members and the writing of the descriptions should be completed in line with the regrouping. It is a good idea to have the descriptions typed so that each team may have them for quick reference during subsequent activities such as executive interviewing. It is also advisable to save the charts for subsequent activities.

Relate the Business Processes to the Organization

Once the business processes are agreed upon and described, they can be related to the organizational structure of the business to help the study team identify any additional people that should be interviewed and to further clarify their understanding of the business processes. Some teams may wish to complete this matrix before completing the process descriptions. Relating the organization to the processes also helps the team determine the information needed from the interviews, such as verification of executive involvement in the processes.

To relate the business processes to the organizational structure of the business, the team develops an organization/process matrix. Essentially, this is a graphic representation of one aspect of the management system of the organization because it illustrates who makes the decision in each of the processes.

The organization/process matrix is one of several matrices developed as part of the BSP methodology. Matrices are used because they provide a convenient method to analyze relationships. They also provide a concise way to convey findings to management.

To prepare the organization/process matrix, the study team uses the business processes already identified. Using their knowledge and perspective of the business and the organization charts from the study preparation phase, the team members identify the organizational entities involved in the processes.

Since the BSP study is intended to provide a broad overview of the business, not every organizational entity is identified. Furthermore, common similar organizations can sometimes be represented as one organizational unit. For example, 100 sales offices may be listed as a single unit. Where feasible, plants and laboratories should also be grouped into units. One-

unit representation is also generally appropriate when organizations of different scopes are doing the same job. For example, a financial planning organization may have three departments, each focusing on separate divisions. The mission of all three is still financial planning, and they can be represented by one organizational unit. Figure 15 illustrates the organization/process matrix.

Once the processes and organizational entities are arranged on the matrix, the study team completes the matrix by indicating the degree to which each organizational entity is involved in the processes. The following symbols are used in Figure 15 to indicate the degree of involvement:

☒ Major responsibility and decision maker
☒ Major involvement in the process
☑ Some involvement in the process

When making this notation on the matrix, leave room for the posting of systems numbers, as explained in Chapter 8.

Such indicators do not describe the actual responsibilities of each of the organizational units but serve only as a guide to assigned responsibility for and involvement in a process. Some businesses have found this matrix to be valuable after the study as an index to a management system manual, in which they develop responsibility and activity statements for each of the organization/process intersects.

The organization/process matrix helps the study team validate the list of individuals to be interviewed and determine the questions to be asked of the individuals responsible for the processes. To authenticate the matrix, each person interviewed by the team should be asked to confirm or correct the portion of the matrix showing his responsibility or involvement.

The organization/process matrix sometimes will show overlapping responsibility and decision-making authority for a process or a lack of decision-making responsibility for a process where it normally would be appropriate. Such potential problem areas are clarified later during the executive interviews.

Identify Processes Key to Business Success

This step will later aid in selecting the area of the business to be studied in more detail (architecture priority), sizing the importance of the problems identified, and identifying items to be stressed in the executive interviews. The strategic planning and management control processes will be some of the outstanding processes. One method of doing this identification is to rank the objectives in order of their importance and then determine which of the processes are most critical in reaching each objective. The process/organization matrix will also contribute to this selection.

Outputs and Their Uses

The output to be expected from defining the business processes consists of:

1. A list of process groups and their processes
2. A typed description of each of the processes
3. A list of the processes key to the success of the business or designated as such on the charts of process groups and processes
4. Product/services flowchart
5. Team understanding of how the whole business operates and is managed and controlled

As mentioned earlier, business processes serve as the base for most of the activities that follow. The ultimate use of the business processes is to identify opportunities and requirements for the use of information systems to support the business. That is also one of the basic goals of the BSP study.

The team members should at all times keep in mind that they probably will not all be working on the follow-on projects after the BSP study. The study should be regarded as an independent operation and the processes defined in such a way that any experienced person can read the output and understand the work that was done in the study. The follow-on projects will start with the output from the study and further define the processes, the problems associated with each of them, and the information requirements.

Expansions and Variations in Approach

Although following the above procedure should result in well-defined processes and supporting material, other considerations and variations are worth mentioning. The more salient of these are covered in the remainder of this chapter.

Diversity in Business, Product, or Service

If the various divisions or parts of the company or the product/services are too diversified to have common processes, a grouping will be necessary before process identification is begun. When all the processes are identified, it is still highly advantageous to look for processes that might have common information requirements.

Outside Assistance

Even though the team members were selected with the aim of having their combined knowledge cover the entire business unit, there may be voids in that coverage. If so, the team should get outside help where necessary for a thorough understanding of the processes. Care should be taken, however, to limit the time of any outsider invited in and to keep that person at the level at which the team has been working on other processes.

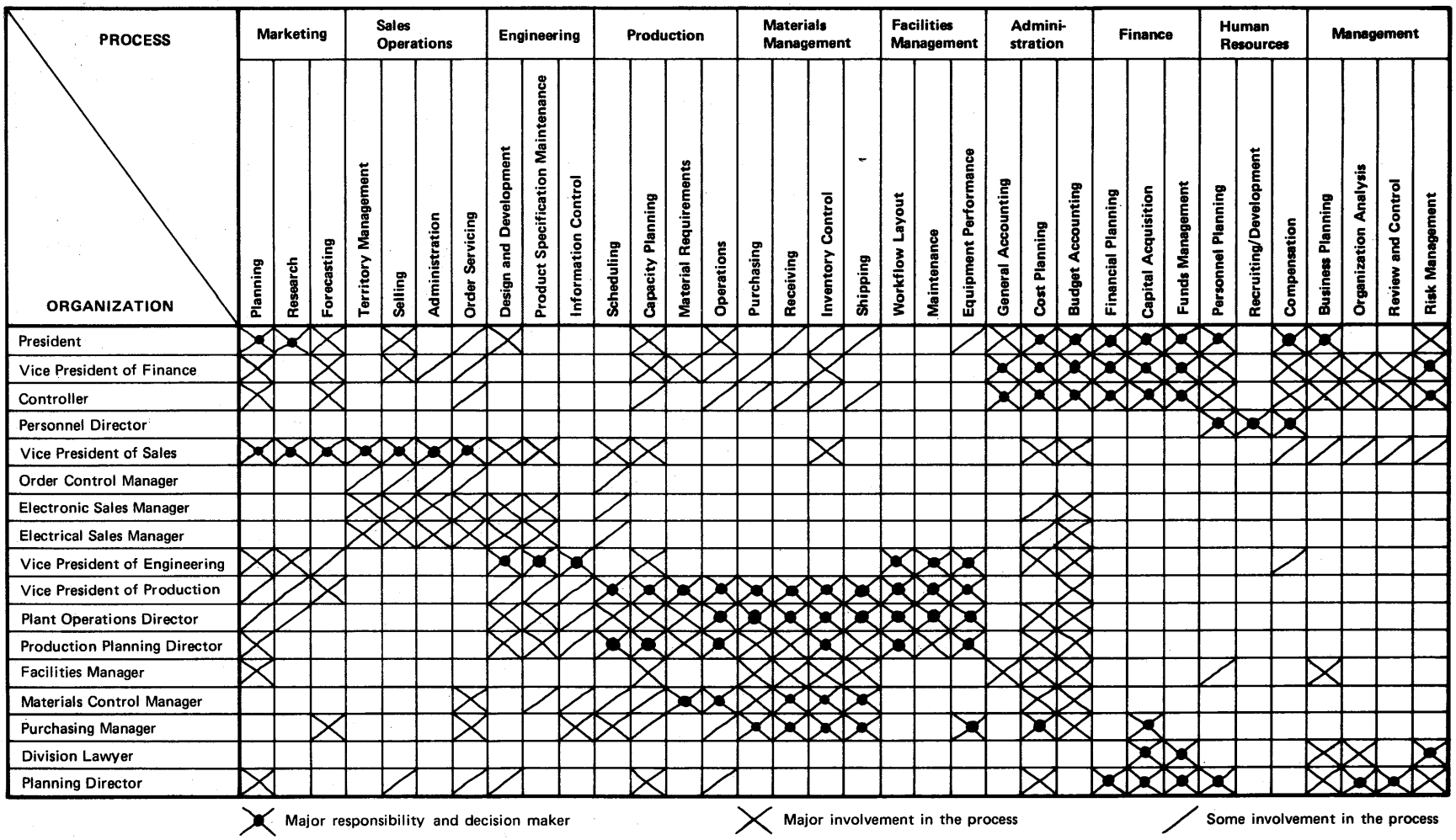


Figure 15. Organization/process matrix

Alternate Methods in Identifying Business Processes

Predefined checklists of processes may be used for the business being studied. These may be found in the appendix, other BSP studies, trade publications, or IBM industry publications such as the Consumer Based Information System (CBIS) or the Communications Oriented Production Information Control System (COPICS). If this method is used, care should be exercised so that the processes are well understood by all the team members and do indeed represent the activities and decisions of the business being studied.

Generic Process Model

An alternate approach in identifying business processes is to use a simple model of the business such as shown in Figure 16.

The model may be expanded to fit the business. For instance, "demand" may become "merchandising" and "selling," while "supply" might break into "product development" and "manufacturing." The following further explains the model:

1. *Supply* includes processes associated with producing the product and obtaining the resources necessary to provide the products or services of the business. These processes normally relate to external interfaces such as suppliers or vendors.
2. *Demand* includes processes associated with making the product or service available and relates directly to external interfaces such as customers or clients.
3. *Requirements* includes processes associated with determining and defining the products or services of the business. These processes normally involve the marketplace and other environmental factors.
4. *Administration* includes processes associated with the overall accountability of the business. These normally involve reporting activities within the organization, such as those directly associated with administration as well as those associated with finance, human resources, and facilities management.
5. *Management* includes processes that tie together the other four aspects of the business. This aspect encompasses the planning, control, and measurement activities of the business.

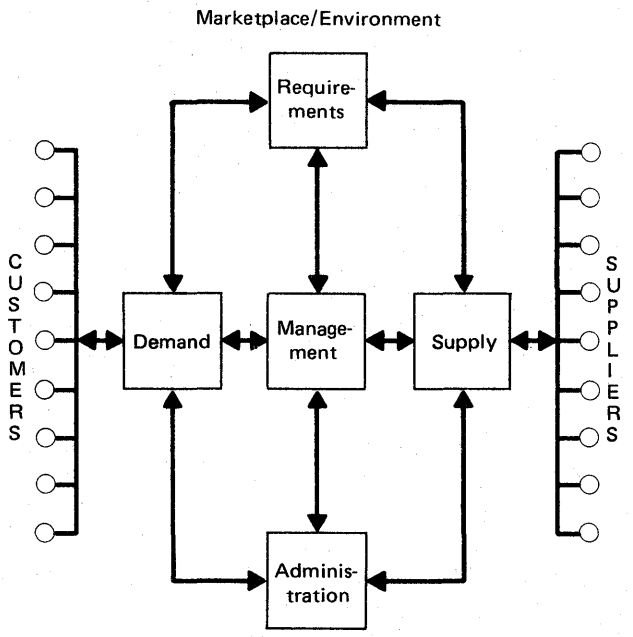


Figure 16. Business process matrix

Chapter 7. Defining Data Classes

A data class is a category of logically related information. Examples of a data class would be customer, vendor, product, order, inventory, etc. Since the purpose of information systems planning is to aid in managing the data resource, the data must be identified. Defining the data classes is one approach to identifying the data to be managed. It also provides valuable assistance in reducing the possibility that data bases developed for early systems projects will require major rework to support later systems projects. Once the processes that support the business have been defined, the next step is to identify the data created, controlled, and used by those processes. As an aid to analysis, the data supporting the processes is grouped into data classes.

Two approaches to identifying data class candidates are presented here, one based on relating data to business entities, the other on relating it to business processes. It is suggested that the two approaches both be used and that their results be cross-referenced to arrive at a final list of 30 to 60 data classes. Data sharing is then illustrated by relating the data classes to the processes that create and use them.

Business Entity Approach

The first approach to identifying data classes is to examine categories or types of data maintained by a business. If the life cycle of resources, previously discussed, is represented as in Figure 17, the types of data related to each stage of the life cycle can be defined.

Planning data, which represents objectives or expectations, supports *requirements* activities. *Inventory* data, which maintains the resource status, supports *stewardship* activities. *Transaction* data effects changes to the inventory data caused by *acquisition* or *disposition* activities. At periodic intervals, *summary* data is extracted from the inventory data to provide feedback on how well requirements have been met. If each business entity is examined for each of these types of data, a set of data classes can be identified.

Entities are simply things an organization or enterprise is concerned about and therefore keeps information about, such as customers, products, materials,

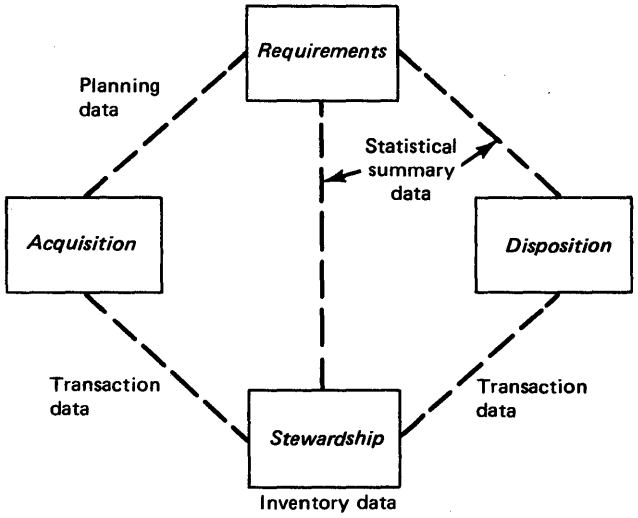


Figure 17. Information life-cycle

personnel, etc. Entities usually include, but are not limited to, the resources around which the business processes were defined.

Since a data class may contain data relevant to a part of a business entity, an entire business entity, or a group of related business entities, the first step in this approach is to identify and list the business entities. A minimum starting list can be made by referring to the resources around which processes were defined. This list can then be expanded with any other significant entities of the business that have data related to them. Seven to fifteen entities are usually identified.

Next, to identify the data classes related to those entities, a matrix is used, with the entities listed horizontally and the major types of data classes listed vertically. Six types of data class will cover most enterprises' requirements. In Figure 18 the six types are Plans/Models, Statistical/Summary, Inventory, and Transaction. Each entity is examined and the appropriate data names filled in for each data class type under the entity. Inventory data types are usually easiest to identify first, as these are the "master file" kinds of information. Transactions that affect the inventory data can next be identified, followed by the summary and planning types of data.

BUSINESS ENTITIES / DATA CLASS TYPES	Product	Customer	Facilities	Material	Vendor		Cash	Personnel
Plans/ Models	Product plans	Sales territory Market plans	Facility plans Capacity plans	Material requirements Production schedule			Budget	Personnel plans
Statistical/ Summary	Product demand	Sales history	Work in process Equipment utilization	Open requirements	Vendor performance		Financial statistics	Productivity Benefit history
Inventory	Product Finished goods Parts master	Customer	Facilities Machine load Routings	Raw Material Cost Bills of material	Vendor		Financial General ledger accounting	Employee Payroll Skills
Transaction	Order	Shipment		Purchase order	Material receipt		Recipts Payments	

Figure 18. Data class/business entity matrix

Business Process Approach

The second approach to identifying data classes uses the previously defined business processes – specifically, what data is created and/or used by each process. This approach involves constructing a series of input-process-output diagrams, one for each of the 20 to 60 processes identified in the business process definition (see Figure 19).

Cross-Referencing and Regrouping

By cross-analyzing Figures 18 and 19 and regrouping on the basis of commonalities or inconsistencies in level, it is possible to compile a manageable list of 30 to 60 data classes.

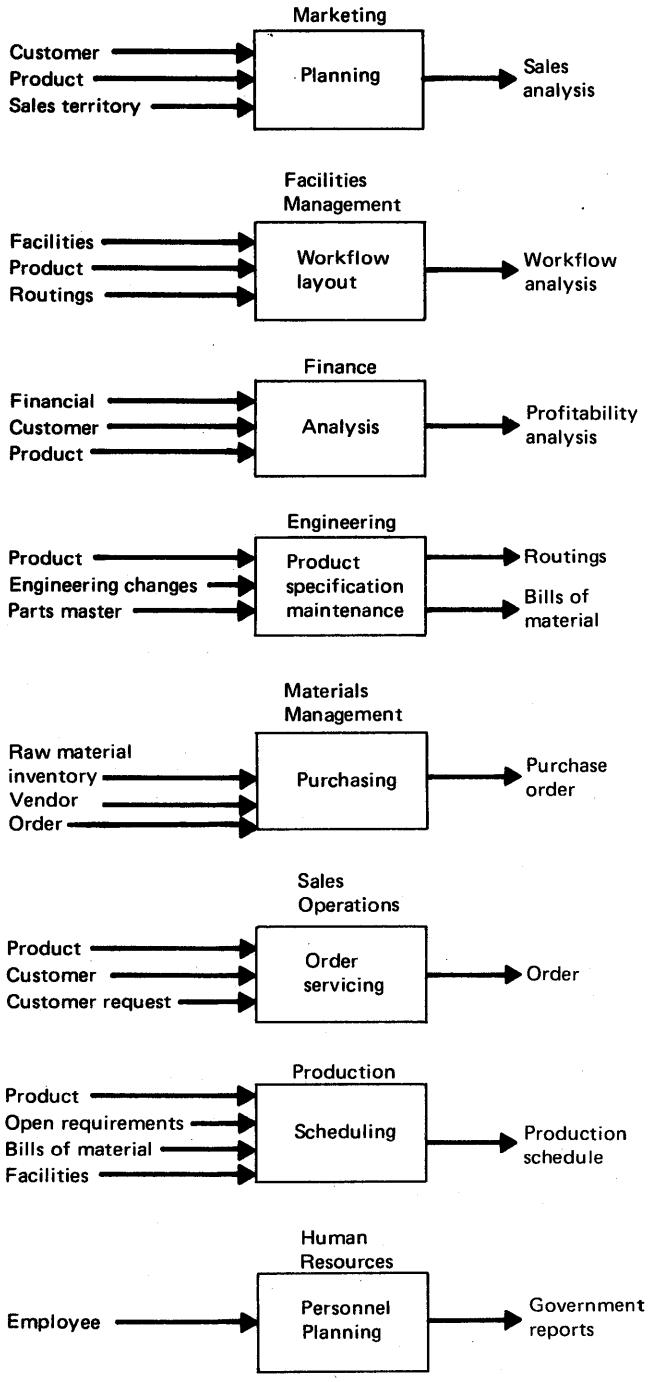


Figure 19. Input-process-output examples

Data Class to Process Analysis

The data classes should then be placed on a matrix opposite the business processes, and the letters C and U should be entered to indicate which processes Create the data and which Use it. Figure 20 shows this plot, with the processes arranged in the life cycle sequence of the key resource. As this matrix shows how data is shared by the processes, it will be used later to develop the information architecture.

PROCESS \ DATA CLASS	Customer	Order	Vendor	Product	Routings	Bill of material	Cost	Parts master	Raw material inventory	Fin. goods inventory	Employee	Sales territory	Financial	Planning	Work in process	Facilities	Open requirements	Machine load
Business planning							C						U	C				
Organization analysis														U				
Review and control													U	U				
Financial planning											C		U	C	C			
Capital acquisition													C					
Research				U								U						
Forecasting	U			U								U		U				
Design and development	U			C		U		C										
Product specification maintenance			U	U		C		C										
Purchasing			C				U											
Receiving			U						U									
Inventory control									C	C					U			
Workflow layout				U	U											C		
Scheduling			U	U											C	U		U
Capacity planning			U		U											U	U	C
Material requirements			U	U		U											C	
Operations					C										U		U	U
Territory management	C	U		U														
Selling	U	U		U								C						
Sales Administration		U										U						
Order servicing	U	C		U														
Shipping		U		U						U								
General accounting	U		U								U		U					
Cost planning		U	U				C											
Budget accounting							U				U		U	U	U			
Personnel planning											C		U					
Recruiting/development											U							
Compensation											U		U					

Figure 20. Data class by process, showing data creation and usage

Chapter 8. Analyzing Business/Systems Relationships

Up to now, the team has been developing a new perspective of the business – learning to look at the business in terms of business processes and the data classes necessary to perform them. Now the team must develop a firm understanding of how data processing currently supports the business, in order to develop recommendations for future action. This section describes the use of data gathered and presented as part of the I/S review as well as the organization, process, and data class information to develop perspectives on:

- I/S support of processes. The organization/process matrix developed in Chapter 6 is annotated to indicate which current systems support the business processes.
- Usage of current data. A system/data file matrix is developed to identify the data files currently in use or planned for use by existing systems.

(A system here is an application or grouping of several applications.)

Each of these matrices is described in more detail in the following pages. Although the matrices provide an overview of the current and planned data processing support of the business, they cannot indicate the extent of support needed or the value of this support to each of the processes. Such information is obtained later during the executive interviews. Used in combination, these matrices are very helpful in providing the team with a broad overview of current systems and data usage.

Understanding I/S Support of Processes

In order to obtain a business-wide picture of existing and planned data processing support, the study team may opt to annotate the organization/process matrix with current systems support (Figure 21). The notations on this matrix identify which organizations involved in the processes are receiving application support. This enables the study team to identify:

- Processes receiving no current systems support
- Processes receiving systems support in some organizational units, but not all
- Possible redundant systems

To create the notations, the team assigns a number to each of the current systems, then posts this number to the appropriate intersections on the organization/process matrix. This may be facilitated by first creating a system/organization matrix (Figure 22) or a system/process matrix (Figure 23).

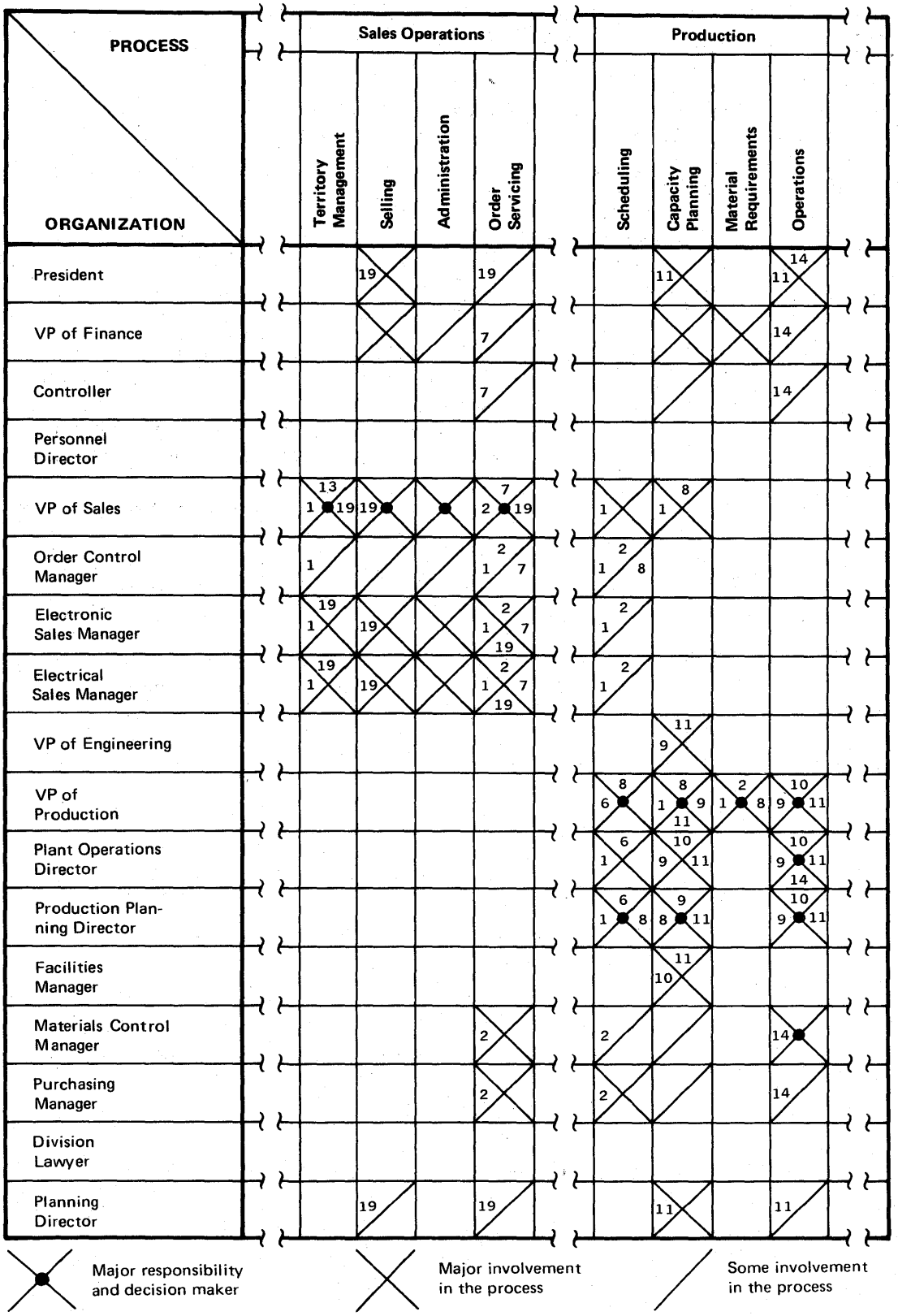


Figure 21. Organization/process matrix, with current systems support shown

ORGANIZATION / SYSTEM	President	Vice President of Finance	Controller	Personnel Director	Vice President of Sales	Order Control Manager	Electronic Sales Manager	Electrical Sales Manager	Vice President of Engineering	Vice President of Production	Plant Operations Director	Production Planning Director	Facilities Manager	Materials Control Manager	Purchasing Manager	Division Lawyer	Planning Director
Customer Order Entry	C/P				C/P	C/P	C/P	C/P		C/P	C/P	C/P					
Customer Order Control	C				C	C	C	C		C	C	C		C	C		
Invoicing		C	C														
Engineering Control									P								
Finished Goods Inventory	C	C	C		C		C	C		C		C	C				
Bills of Material									C	C	C	C	C				
Parts Inventory		C	C		C	C	C	C				C					
Purchase Order Control					C/P	C/P	C/P	C/P		C/P	C/P	C/P					
Routings									C	C	C	C					
Shop Floor Control										C	C	C	C				
Capacity Planning	P								P	P	P	P	P				P
General Ledger		P	P														
Expense			C		C												
Product Costing	C/P	C/P	C/P		C/P		C/P	C/P	C/P		C/P		C/P	C/P	C/P		
Operating Statements	C	C	C														
Accounts Receivable																C	
Accounts Payable	C	C	C														P
Asset Accounting	C	C	C													C	
Marketing Analysis	C				C		C	C									C
Payroll				C													

C Current P Planned C/P Current and Planned

Figure 22. System/organization matrix

PROCESS / SYSTEM	Marketing			Sales Operations				Engineering			Production				Materials Management				Facilities Management			Adminis-tration			Finance			Human Resources			Management			
	Planning	Research	Forecasting	Territory Management	Selling	Administration	Order Servicing	Design and Development	Product Specification Maintenance	Information Control	Scheduling	Capacity Planning	Material Requirements	Operations	Purchasing	Receiving	Inventory Control	Shipping	Work Flow Layout	Maintenance	Equipment Performance	General Accounting and Control	Cost Planning	Budget Accounting/Tax Accounting	Financial Planning	Capital Acquisition	Funds Management	Personnel Planning	Recruiting/Development	Compensation	Business Planning	Organization Analysis	Review and Control	Risk Management
Customer Order Entry				C/P			C/P				C/P	C/P	C/P																		C/P			
Customer Order Control							C			C	C		C		C																			
Invoicing																						C			C									
Engineering Control										P																								
Finished Goods Inventory															C	C	C					C	C											
Bills of Material									C	C	C				C								C											
Parts Inventory							C								C		C																	
Purchase Order Control											C/P	C/P	C/P		C/P																			
Routings										C		C		C																				
Shop Floor Control										C		C		C			C																	
Capacity Planning												P		P																				
General Ledger																						P				P								
Expense				C																		C												
Product Costing										C/P				C/P			C/P						C/P												
Operating Statements																						C								C	C			C
Accounts Receivable																						C												C
Accounts Payable																						C								C				C
Asset Accounting																								C		C								C
Marketing Analysis				C	C		C																										C	
Payroll																						C		C					C					

C Current P Planned C/P Current and Planned

Figure 23. System/process matrix

Identifying Usage of Current Data

The team needs to understand what data is currently automated and where, that is, which systems utilize which portions of the data. The next matrix developed by the study team, the system/data file matrix (Figure 24), provides this understanding. The systems annotated in Figure 21 form the vertical axis of this matrix, while the data files, grouped by similarity, form the horizontal. An X is placed in each appropriate box to show which data files support which systems.

This matrix sheds more light on how much data is shared by various systems. This, in turn, helps point out the need for a data base approach to provide consistency of data. The information gathered here will also be useful later in developing implementation priorities.

Summary

Some teams find it convenient to use various matrices as communications/presentation tools. Different combinations of two or more (those that share common axes) may be so used.

These charts and matrices provide an overview of the current and presently planned data processing support of the business. Such information should be obtained from the executive interviews regarding problems with current data processing support and additional needs for information. These charts, together with the executive interviews, help the study team determine those areas where emphasis should be applied in developing and enhancing appropriate information systems.

Appendix F contains examples of matrices from other industries.

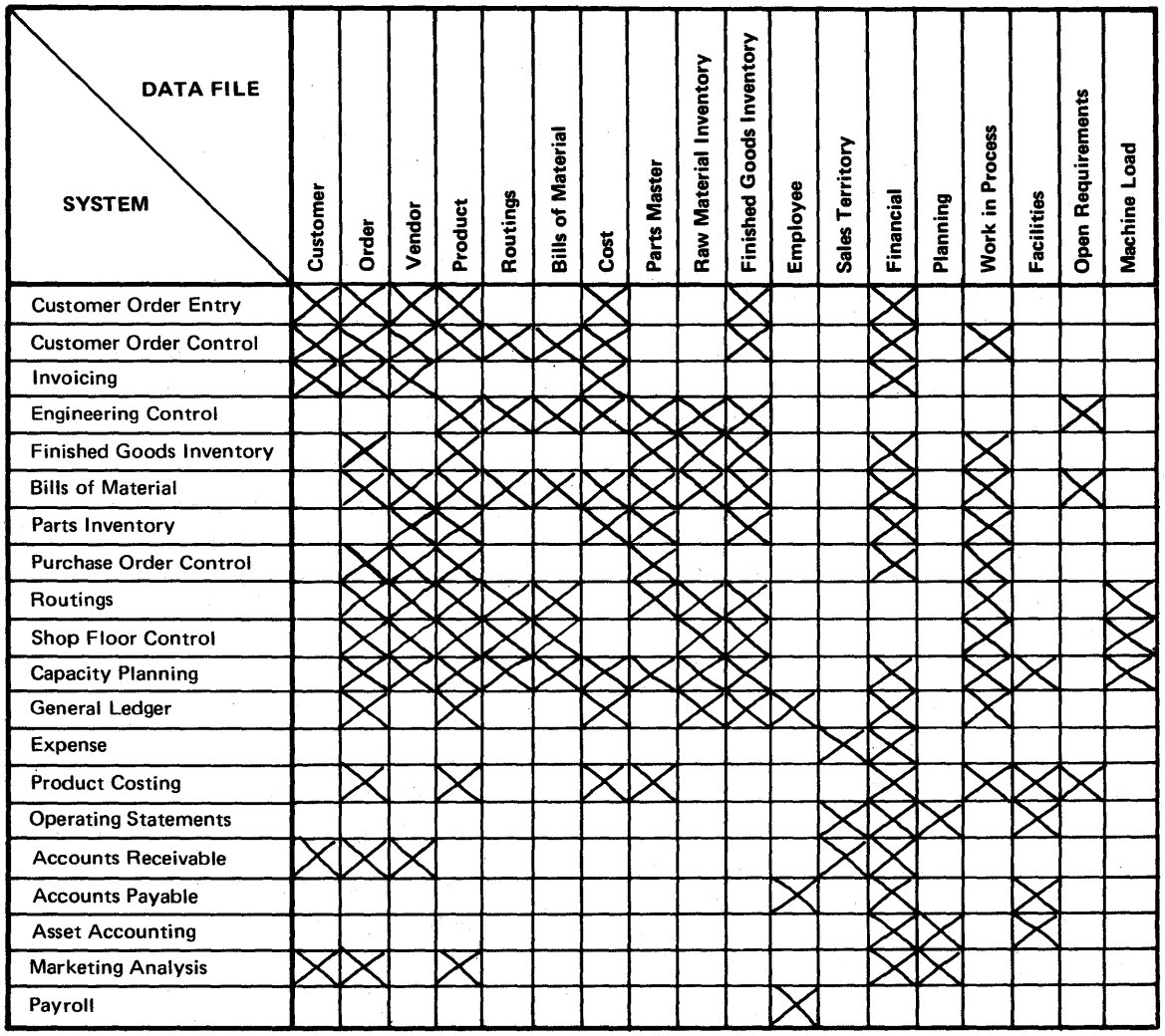


Figure 24. System/data file matrix

Chapter 9. Determining the Executive Perspective

Interviewing and interview analysis consume more time during the study than any other activity because the executive interviews are the primary source of information for determining the business problem and management's need for support in overcoming their problem and/or supporting new opportunities.

The interviews are not intended to gather data on the specific details and exact form of the information required by the interviewees.

Specifically, the purpose of the interviews is to:

- Validate the data gathered, analyzed, and documented in matrices and charts
- Determine the information needed by individual executives as well as their problems and priorities
- Gain executive rapport and involvement
- Determine management values and quantify benefits to be derived by modifying or adding applications.

The tasks that have to be accomplished in order to conduct the interviews are:

- Confirm the list of executives to be interviewed that was developed during study preparation
- Review the interview schedule to be certain it is practical, and confirm it with the interviewees
- Organize wall charts in control room
- Review the questions that apply to all interviewees, and develop individualized questions for certain executives, as appropriate
- Determine the role of study team members for each interview and the characteristics of individual interviewees
- Conduct the interview itself
- Prepare a summary of each interview to be approved by the interviewee

This chapter is devoted to a discussion of these tasks.

Confirming the List of Executives To Be Interviewed

During BSP study preparation the team identified the executives that should be interviewed. The team most likely selected managers no more than two levels below the president. Now, aided by the organization/process matrix, the team can confirm its earlier list of interviewees and identify any other executives that should be included.

Two questions can be answered using this approach:

- What organizations are involved in each of the processes?
- Within those organizations, who must be interviewed to determine the problems, objectives, and requirements?

Sometimes it is difficult to assign final responsibility for a process to one specific organizational entity. Several organizations may reach a decision together.

In some cases it is necessary to interview certain managers for political reasons; if they don't have an opportunity to participate in the study, they may oppose any recommendations that result from it. It may also be advisable to interview a particular executive simply because other executives of the same level will be interviewed. This decision normally is made by the executive sponsor.

Reviewing the Interview Schedule

When the list of executives to be interviewed has been updated and confirmed, the study team confirms the interview schedule. Interview preparation time should always be allowed. Experience indicates that an effective interview requires two to four hours, excluding preparation. Therefore, only two interviews should be scheduled for a given day. Normally, 10 to 20 interviews are conducted during the study, although this number varies greatly with the size and requirements of the business.

It is recommended that higher executives be interviewed last. For one thing, interviewers' techniques and procedures improve with practice, and the team should be working at its best before interviewing top managers. Second, any suspicions or doubts the team may have about information obtained from the first executives interviewed can be resolved by formulating specific questions for top management.

Preparing Questions for Interviews

Before the interviews are conducted, the study team prepares a list of general questions that apply to all interviewees. The team also may prepare specific questions for certain executives, as needed. The following general questions, while furnished *only as a guide*, usually apply to all interviewees:

1. Briefly, what is your area of responsibility?
2. What are its basic objectives?
3. What are the three greatest problems you have met in achieving these objectives within the last year?
4. What has prevented your solving them?
5. What is needed to solve them?
6. What value (in man-hours saved, dollars saved, or programs enhanced) would better information have in these areas?
7. In what other areas of your responsibility could the greatest improvements be realized, given the needed information support?

8. What would be the value of these improvements in man-hours saved, dollars saved, or programs enhanced?
9. How would you rate your information support with respect to adequacy, validity, timeliness, consistency, cost, and volume?
10. What is the most useful information you receive?
11. How are you measured?
12. How do you measure your subordinates?
13. What other kinds of measurement are you expected to make?
14. What kinds of decisions are you expected to make?
15. What major changes are anticipated in your area in the next year? Three years?
16. What do you expect to result from this study? What does it mean to you and to the business?
17. Do you have any additional thoughts or comments?

The interviewer must understand the purpose of the general questions in order to be sure that the needed information is elicited. If an interviewee's response does not provide the information desired, it may mean that the question should be worded differently. Let's examine the purposes of the general questions and kinds of responses needed:

- Questions 1-2. The interviewer asks the executives what their responsibilities are because conclusions drawn from the organization chart may not be correct. Also, the objectives that executives set for themselves in performing their functions may have a large bearing on their information needs.
- Questions 3-6. When asking about problems, the team should be sure that the executives do not indicate only their last problems. Sometimes people overlook more serious problems that occurred months before.
- Questions 7-9. The information satisfaction and needs questions should focus on the additional costs that may be incurred from inaccurate and untimely information. The value of any additional information desired should also be determined.
- Question 10. The team must determine where the current information support is adequate so that these benefits are retained.
- Questions 11-13. The questions concerning measurement are intended to disclose how the effectiveness of resource allocation and use is measured. A major factor in business success is efficient use of resources.
- Question 14. The question on what decisions are made is intended to disclose whether executives receive adequate information on which to base them.
- Question 15. The questions on anticipated changes are important because major information systems development cycles can take from two to five years to complete. Recommendations for information systems development could be impacted by plans to centralize, decentralize, change the organization, introduce new products, etc.
- Question 16. The questions regarding expectations for the BSP study may help the study team ascertain how likely management is to accept and implement the study recommendations.
- Question 17. Additional thoughts and comments make an appropriate way to terminate the interview.

Determining Team Member Interview Roles and Interviewee Characteristics

One of the tasks that must be performed when preparing for interviewing is to assign roles for team members to play during the interviews. There are several factors to consider when making these assignments.

The interview team is drawn solely from study team members and may include IBM representatives. Regardless of the number of people on the study team, there are usually no more than four active team members present at any particular interview.

A given team member need not play the same role in each interview. Furthermore, some members are usually assigned to more than one role in an interview. The following roles should be filled:

- An individual to present the study objectives and approach to the interviewee. This person may have another role in the interview as well.
- An interviewer.
- A backup interviewer to listen carefully to the proceedings to make sure that all questions are asked and that all answers are understood. The backup interviewer asks any additional questions necessary.
- Someone to take notes during the interview and have them organized, typed, and presented to the interviewee afterwards for approval.
- A supplementary note-taker if the situation requires.

Sometimes the interviewee is a member of a department in which a team member serves. Because of the possible sensitivity of some of the information, it may not be advisable for that team member to be an interviewer during that session. Perhaps the individual should not even be present. Similarly, if there are any personality clashes between an interviewee and a particular team member, that team member should probably not be presented at the session.

In determining who will serve in what roles, consideration should be given to individual abilities. Some people are better speakers than others; some are fast

and accurate note-takers. The interviewer for any session should be chosen for knowledge of the area of the business to be investigated and for ability to achieve rapport with the interviewee.

Before each interview session, the study team should meet to discuss various matters that are specific to that interview. The responsibility of individual team members during the interview has already been covered. The study team should also review:

- Background of the interviewee
- Responsibilities of the interviewee
- Process in which the interviewee is involved
- Data processing support provided to the interviewee's area of responsibility
- Specific questions to ask the interviewee, which may be based on prior interviews with other executives

Conducting Interviews

The best location for interviews is the study control room, where interruptions are least likely and where the matrices and charts can be displayed on the walls for reference. If the control room is close to executive offices, it should be convenient for the interviewees.

The following sequence of activities will normally transpire after the interviewee arrives and has been introduced to the interview team:

- The interviewee should be walked through the wall charts by the interviewer and he should be asked to validate the data on the charts. There should be agreement between the interviewee and the study team on the business process definitions and their relation to the organizational entities, particularly within the interviewee's area of the business. Make changes to the wall charts if necessary. (See Appendix G.)
- The interviewee is seated so that he can see the wall charts during the interview. This should make the interviewee more comfortable and thus enhance support.
- All the general questions and any specific questions previously formulated are asked. Many questions are likely to arise in the course of the interview and these are also asked.

As indicated before, the interviewer often needs to ask more questions than were prepared. It is impossible to predict all the possible responses that an executive might offer. From statements made during the interview, new questions are bound to arise. Furthermore, questions often must be formulated or restated during the interview to elicit the exact information needed. This is particularly true when trying to secure value statements that can be quantified, especially when discussing intangibles.

Following are some techniques that can be used to prompt an interviewee to express values quantifiably:

- Have the interviewee express a potential benefit as a percentage.
- Have the interviewee express a potential benefit in terms of a range – for example, a saving of $200,000 to $400,000.
- If the interviewee gives an exceptionally high value that might not be acceptable to other managers, suggest using 50 percent of that figure.
- In a particular operational area, cite a well-known industry average.
- Determine the company's present position in the industry and ask what it would be worth to be in a stronger position.
- Employ in-depth logical questioning. If the value of a particular benefit cannot be quantified by the interviewee, try to break down the various costs of not having the benefit.
- Determine the objectives against which the executive is measured and what it would be worth to achieve those objectives.
- Determine what the company is currently spending, what the forecasts are, and how these spending levels would be affected if a certain capability were available.

The interviewer must be sensitive to the responses of the executive in order to probe more deeply into any subject area when appropriate. Team members should be attentive to the executive's tone of voice and facial expressions, which are often a key to underlying feelings.

Preparing Interview Summaries

The study team should keep current with the documentation of the interviews. Immediately after the interview has been concluded, the two study team members who were taking notes during the interview should pull the notes together and have them summarized and typed.

Summaries should be formatted so that problem statements and key points appear in separate paragraphs. Each problem statement and key point can then be easily extracted for later analytical work. The summaries are reviewed by the team leader, then presented to the interviewee for approval. The interviewees should approve and return them to the study team within two days after the interview so that all team members can keep informed. Copies should be given to all the team members and one copy filed as the official study team document.

In addition, any changes resulting from the interview should be posted to the wall charts to keep them as accurate as possible.

As the interview summaries are returned, the study team members can begin to assess the business problems and/or opportunities (see Chapter 10).

Chapter 10. Assessing Business Problems and Benefits

The reduction and use of data obtained during the BSP interview process is extremely important. This chapter presents a structured and proven procedure to organize interview data and provide a useful format for later use in determining information architecture and priorities. Figure 25 presents a logical flowchart of the data reduction procedure and is keyed to the text by step number.

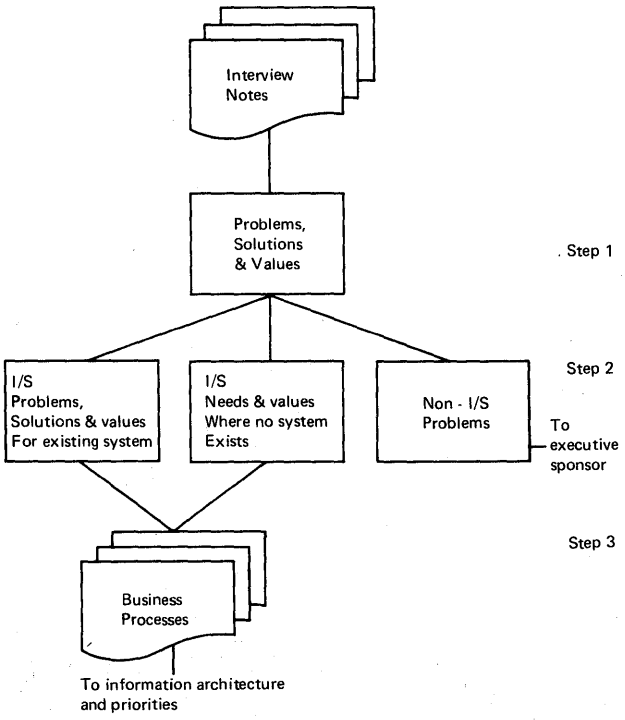


Figure 25. Data reduction steps

Step 1: Summarize Interview Data

The team selects out of each set of interview notes (1) the problems, (2) solutions (if given), (3) value statements – tangible or intangible – if given, (4) the processes impacted, and (5) the processes causing the problems.

Problems as stated by the businessman may be "perceived problems" (that is, perceived from the impact they make on a particular process) or they may be actual root-cause problems. "Perceived problems" are necessarily the starting point for problem assessment in BSP. A perceived problem is something a businessman sees as a problem. It may turn out to be a real problem, an incomplete version of a real problem, or just a symptom of one.

In order to assess problems objectively, therefore, perceived problems must first be traced back to root causes and forward to end-effects. The loss represented by each end-effect may then be quantified as far as possible, and the relative contributions of root causes to that loss may be assessed.

Figure 26 illustrates the worksheet to be used in this step. The team, as a unit, then considers the individual analyses and drafts a composite list of problems, solutions and values. The team must take care to select only stated problems and not implied problems. If the team decides that an implied problem is of a magnitude and importance that it should be further clarified, communication with the interviewee on a formal or informal basis should be undertaken in order to establish the specifics and/or magnitude of the "implied problem." If the communication establishes additional significant data not in the original notes, it must be added as an addendum to the validated original notes with reference to the follow-on communications. A copy of the addendum must be forwarded to the interviewee for his validation.

The entire composite list should now be typed with double spacing between entries. Each entry must be code-connected to the original interviewee. Assigning a number or letter or combination of same to each interviewee allows his identity code to be attached to each entry, while maintaining confidentiality.

Step 2: Classify Interview Data

Using the interview notes and worksheets, the team now examines each line entry and establishes whether it is in the category of:

1. I/S problems/solutions and values (existing systems)
2. I/S needs and values (no system exists)
3. Non-I/S problems

Sometimes a problem will have both an organizational solution and an I/S solution. Example: "There is a need for better marketing research information." This may require that a research group be established to gather information and an information system be developed to store and manipulate the information. At the end of step 2, the line entries extracted from the interview process should be in the three categories named above.

It is critical at this point that the "non-I/S problems" be logically grouped, stripped of all identity, and very carefully handled. It is not the mission of the BSP study team to solve the non-I/S problems. However, the information obtained in the interview processes, which relates to these problems, is important and should be properly presented to the appropriate individual (usually the sponsor) for his consideration and appropriate action.

Interviewee: Mr. H.R. Zimmer, Vice President of Production

Team Member: Mel Aksarben Date: August 24, 1978

Major Problem	Problem Solution	Value Statement	Information System Needs	Process/Group Impacted	Process/Group Causing
Lack of effective production planning impairs profitability	Mechanized production planning	Improve profit; improve customer relations; improve service of supply	Production planning	Production	Production
Increasing accountability of board of directors; demand for financial and management auditing	Better information	Increase value from outside directors	Cost system	Finance	Finance
Lack of "what if" capability on cost sheets	Mechanized online cost sheet capability	Improve profit; better customer relations	Cost system	Finance	Administration
Inability to look at enough alternatives in business planning	Financial modeling ("what if" capability)	Raise profit; curtail losses; improve growth	Planning simulation	Finance/management	Management
Lack of ability to identify and promote qualified people	Better information on personnel resources	Retain good people; improve morale	Skills inventory system	Human Resources	Human Resources
Lack of expertise in marketing impairs growth and profits	More marketing awareness and more people with marketing expertise	Satisfy customers		Marketing	Human Resources
Loss of ability to effectively transfer people; low productivity. Long training	Description of work to be done in each area	Manage people properly; improve quality of work; increase productivity	Order status	Human Resources	Sales Operations
Poor customer relations; loss of profit; excessive inventory	Better sales analysis and productive planning; better buyer reports	Improve customer relations	Order status	Marketing	Sales Operations
Poor customer relations; loss of profit; excessive inventory	Better sales analysis and productive planning; better buyer reports	Improve customer relations	Production planning	Marketing	Production
Poor customer relations; loss of profit; excessive inventory	Better sales analysis and productive planning; better buyer reports	Improve customer relations	Sales analysis	Marketing	Marketing
Smaller, more frequent orders; lead times too critical; higher cost of handling orders	Order trend analysis/costs	Control cost better	Territory analysis	Sales Operations	Sales Operations

Figure 26. Interview analysis and data reduction worksheet

Step 3: Relate Data to Processes

All of those interview entries which were grouped as I/S problems/solutions or I/S needs and values should now be cut from the worksheet. Example:

K-2 Lack of effective production planning impairs profitability	Mechanized production planning	Improve profit; improve customer relations; improve service of supply	Production planning	Production	Production

Next a flipchart page should be created for each business process group and its processes. These should be arranged around the control room at a level handy to "post" to. Team members then take each of the prepared interview entries and stick them onto the flipchart for the business process that causes the problem. If possible, the entry should be placed within the process most appropriate.

Don't worry about being too precise on the first "posting." Additional teamwork is required to finalize the procedures.

When all entries have been "posted," the team concentrates on one business process at a time to ensure that all entries have been posted to the right process. It is normal to have to go back to the original validated interview notes or even the original handwritten notes to firmly establish the topic area and background that triggered the interview comment (entry). The need for mobility of the item entries quickly becomes obvious during this fine-tuning step.

Summary

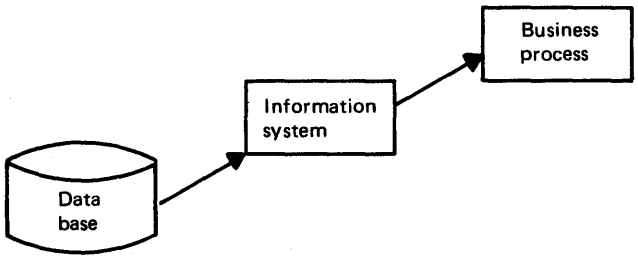
It is possible to group the interview data entries in several ways. They may be related to the causing processes or the impacted processes using matrices as illustrated in Figure 27 or in other summary formats as appropriate. This data will provide valuable perspective as the team develops recommendations on information architecture and systems priorities.

PROCESS GROUP / PROBLEM	Marketing	Sales operations	Engineering	Production	Materials management	Facilities	Administration	Finance	Human resources	Management
Market/Customer Selectivity	2	2								2
Quality of Forecasting	3									4
Order Entry Log		3					1			
Product Line Profitability	1							1		
Market Share Deterioration	3									2
Product Development Support			4					1		1
External Reporting Requirements							1	1		
Control of Orders		4	3	6			2			
Facility Planning			1	1		2				
Inventory Level Consistency				5	5					
Purchasing Control				6	2					
Control of Production Costs				2			5			
Labor and Machine Utilization				5						
Plant Performance Measurements				5						
Shop Manpower Utilization				2						
Asset Performance								1		
Variance Analysis							2	1		
Working Capital Management								2		
Manpower Development									1	
Job Descriptions									3	
Total	9	9	8	32	7	2	11	7	4	9

Figure 27. Problem/process matrix, showing the number of times the problems were stated

Chapter 11. Defining Information Architecture

Having acquired an understanding of the business processes and the data required to support them, the team should continue its analysis by determining how the data will be managed to support the processes. The data classes that have been identified can be logically grouped into data bases. Information systems then become the vehicles used to insert data into and extract it from data bases, and formulate useful management information to support the business processes.



In order to identify the information systems and subsystems areas to be developed, an *information architecture* is defined, using a diagram that shows the relationship of data to systems and the processes supported by each. The architecture diagram, then, is the blueprint that outlines for each system area (1) the data created, controlled and used, (2) the relationship of system to system, and (3) the systems that support a given process. The architecture diagram allows us to take into consideration the data requirements of later subsystems at the time of developing earlier subsystems in order to maximize sharing of data.

First, the architecture is developed by evolving through several iterations of a process/data class matrix. Data flow is then added to the architecture, followed by subsystem identification and analysis of subsystems for prerequisites.

Developing the Architecture Diagram

Begin with the process/data class matrix where the process axis is in life cycle sequence based upon the key resource, as in Figure 28. Next, arrange the data axis by taking all data classes created by the first process and grouping them to the left, or origin of the matrix. Group all data classes created by the second process next to those created by the first process and continue this grouping until all data classes are covered. Figure 29 shows the result, with all "creates" grouped diagonally from the matrix origin to the opposite corner.

Although the next step is somewhat a matter of judgment, the object is to group the processes and data into major systems areas. This can be accomplished by looking at the process groups and the data created by them, then boxing in these groupings as in Figure 30. Where a process group creates no data, the box is arbitrary. The boxes represent logical subsystem groupings with responsibility for creating and maintaining specific related classes of data.

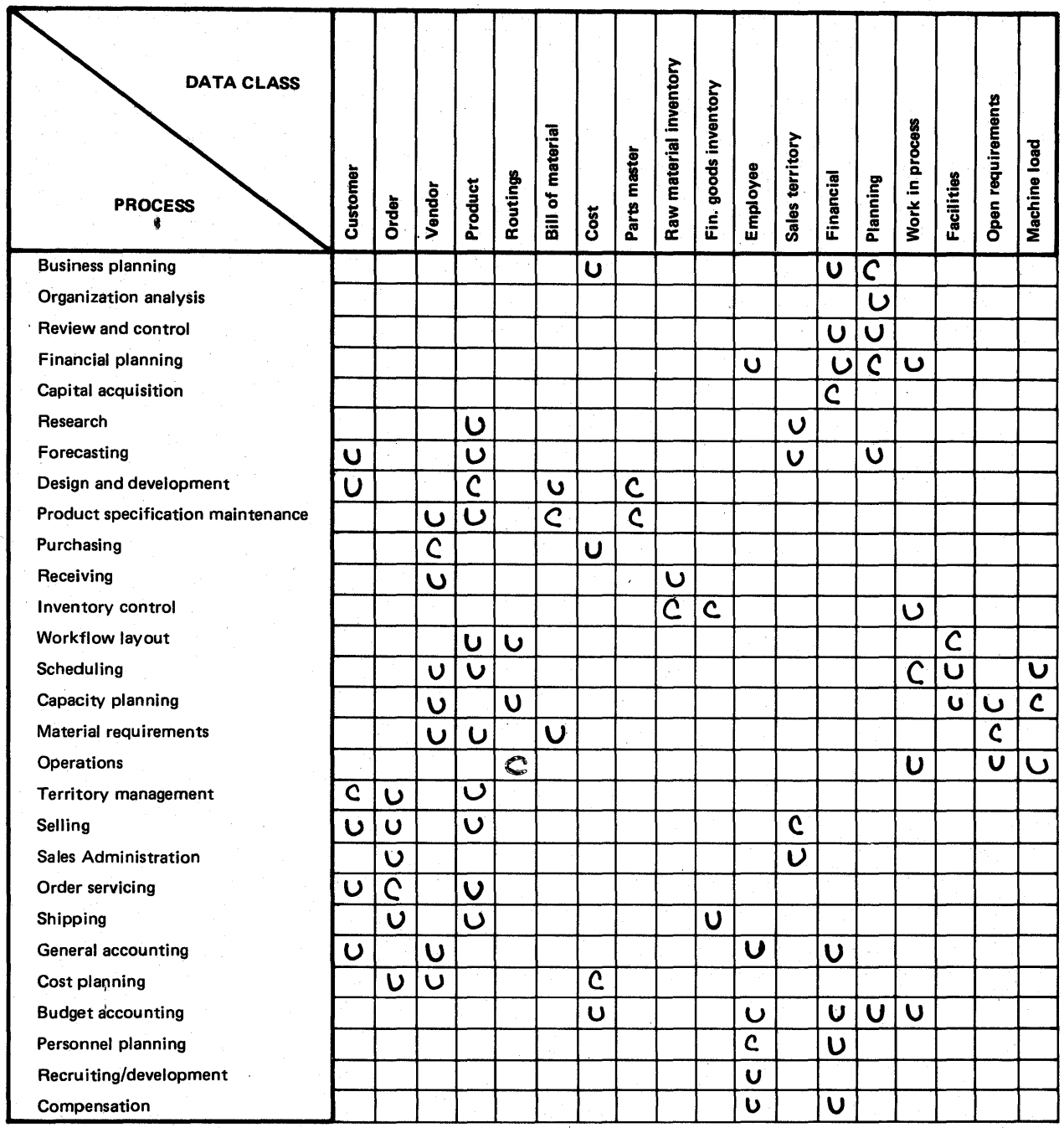


Figure 28. Data class by process, showing data creation and usage

PROCESS \ DATA CLASS	Planning	Financial	Product	Parts master	Bill of material	Vendor	Raw material inventory	Fin. goods inventory	Facilities	Work in process	Machine load	Open requirements	Routings	Customer	Sales territory	Order	Cost	Employee
Business planning	C	U															U	
Organization analysis	U																	
Review and control	U	U																
Financial planning	C	U								U								U
Capital acquisition		C																
Research			U												U			
Forecasting	U		U											U	U			
Design and development			C	C	U									U				
Product specification maintenance			U	C	C	U												
Purchasing						C											U	
Receiving						U	U											
Inventory control							C	C		U								
Workflow layout			U						C				U					
Scheduling			U			U			U	C	U							
Capacity planning						U			U		C	U	U					
Material requirements			U		U	U						C						
Operations										U	U	U	C					
Territory management			U											C		U		
Selling			U											U	C	U		
Sales administration															U	U		
Order servicing			U											U		C		
Shipping			U					U								U		
General accounting		U				U								U				U
Cost planning						U										U	C	
Budget accounting	U	U								U							U	U
Personnel planning		U																C
Recruiting/development																		U
Compensation		U																U

Figure 29. Data classes arranged by creating process

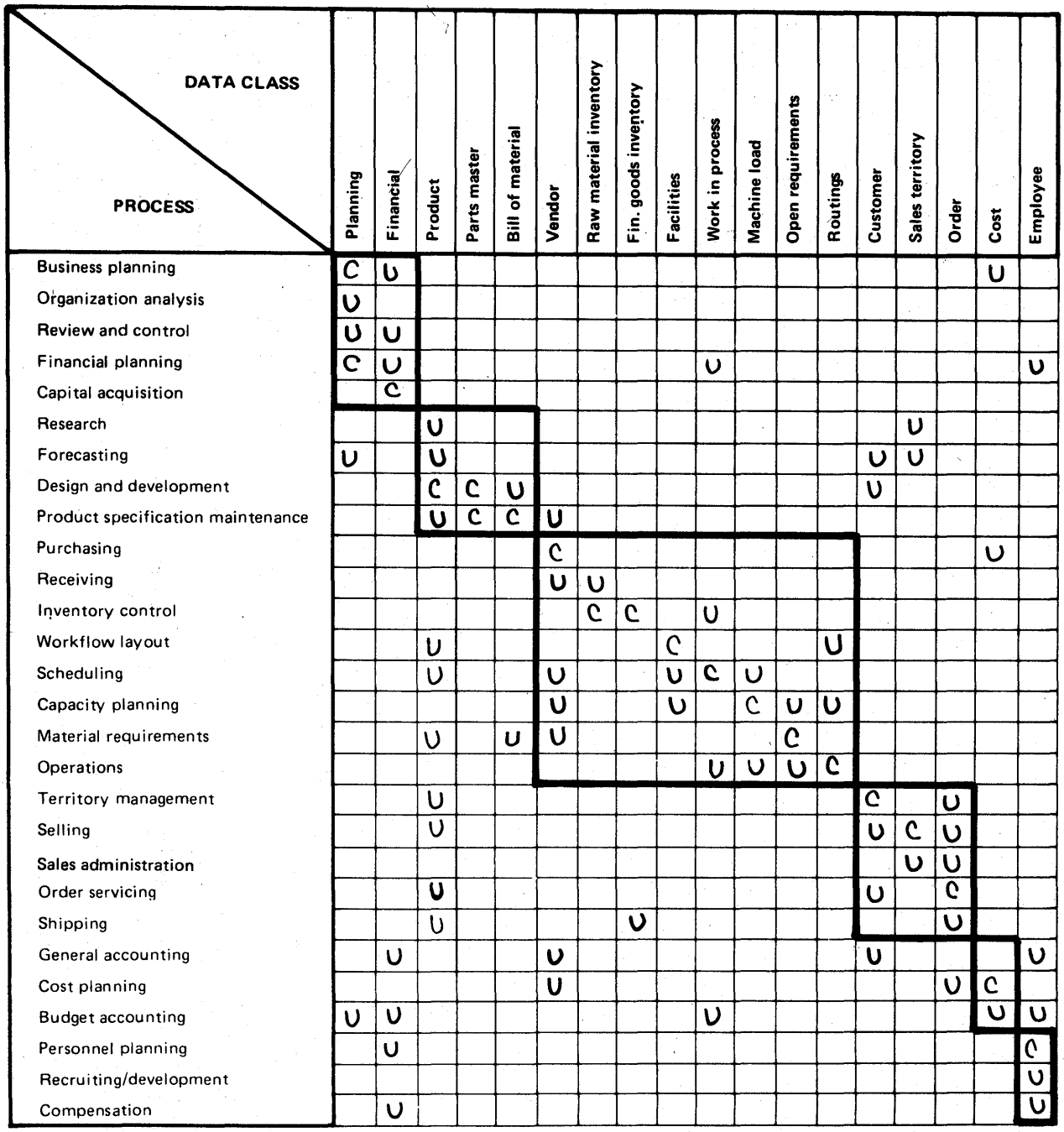


Figure 30. Process/data class groupings

Data Flow

Where the U falls outside a system box, a means to represent data flow from one system area to another is desirable. This flow is represented by arrows in Figure 31. The third system down uses "Product" data created by the second system. The arrow shows data flow from the second to the third system. The second system uses "Customer" data created by the fourth system, so an arrow indicates this data flow. Figure 32 shows all data flow from system to system represented by one-way arrows. This figure will be used later for subsystem identification.

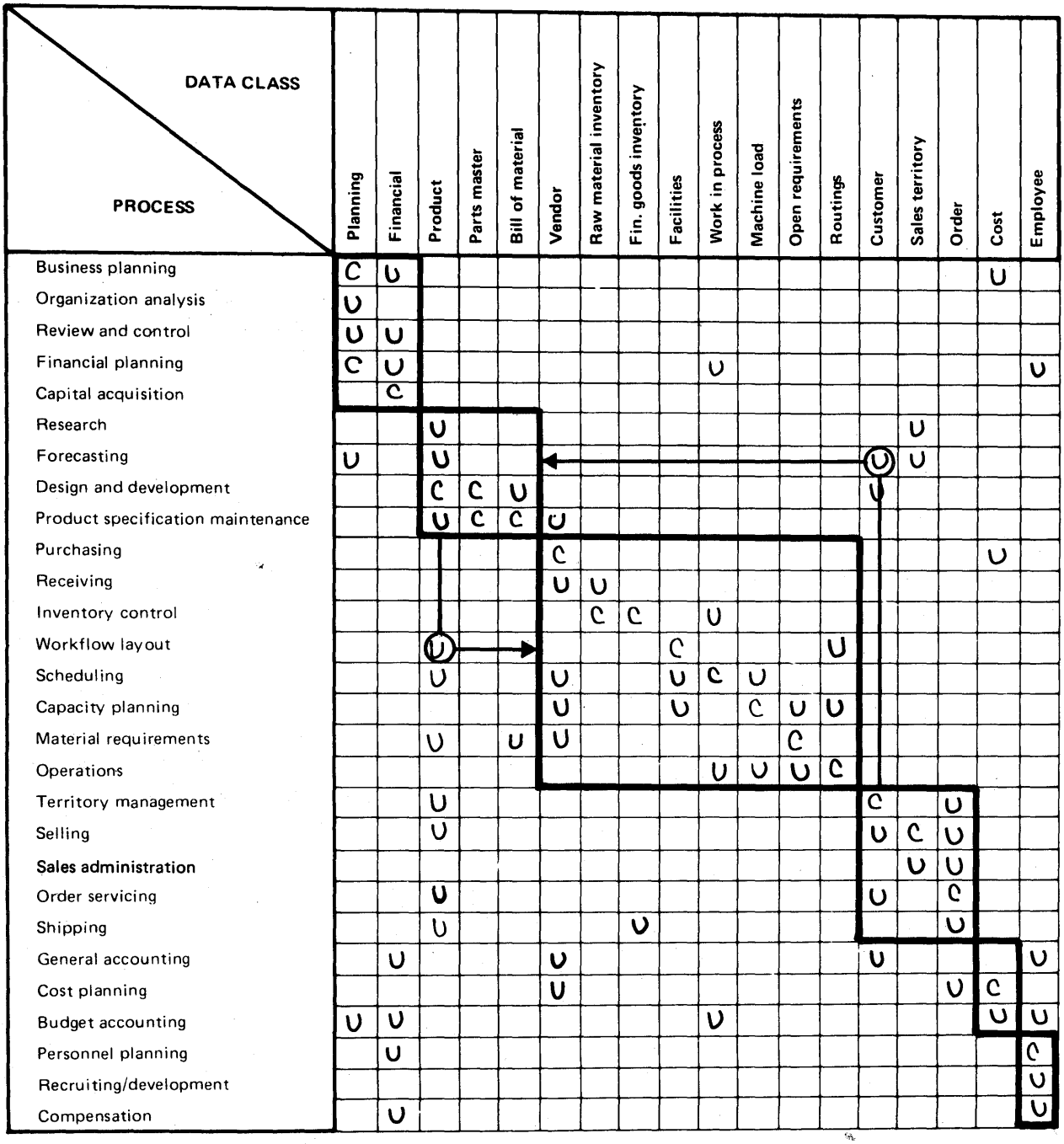


Figure 31. Data flow determination

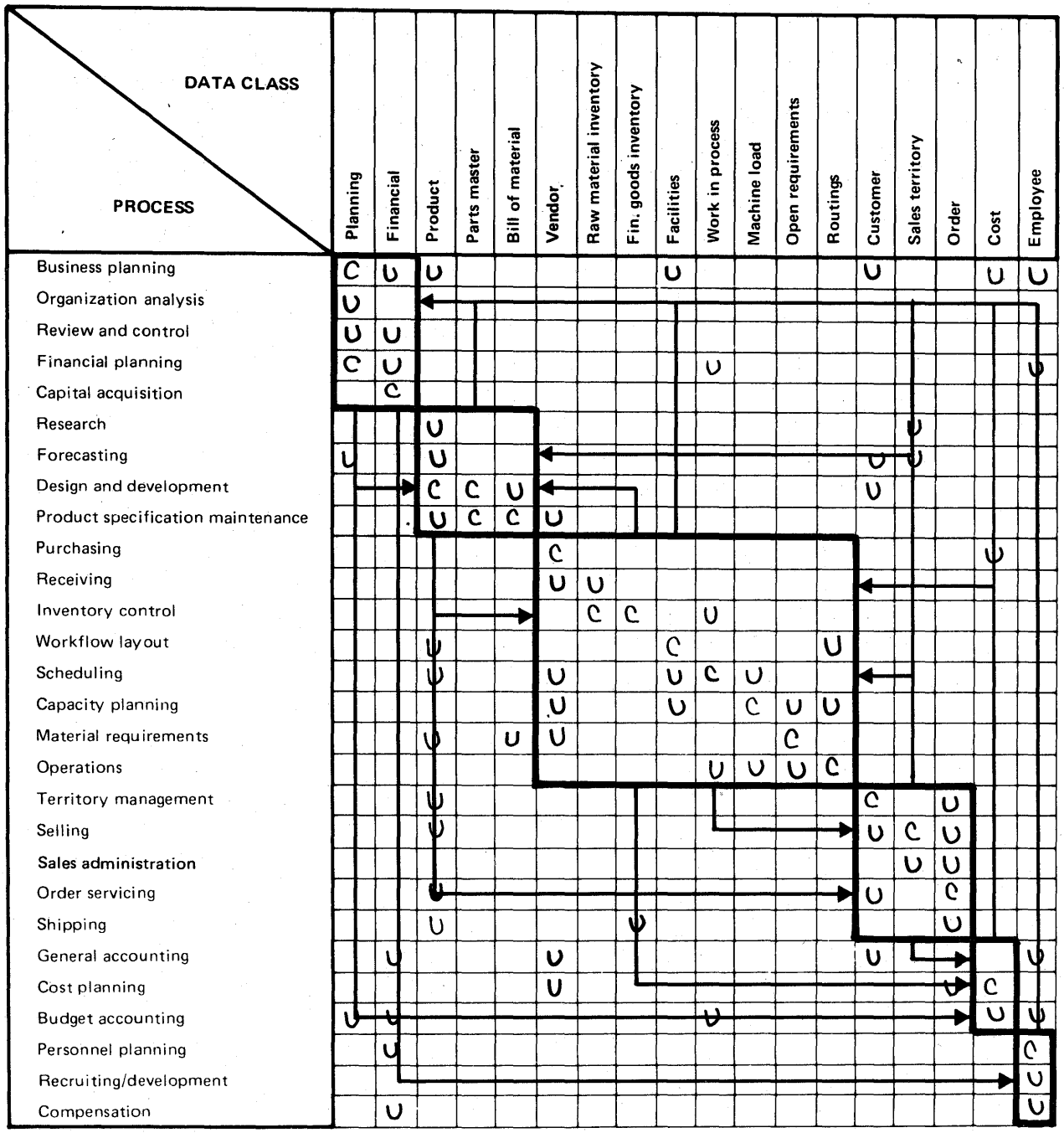


Figure 32. Data flow

With data creation and use indicated by the boxes and arrows, the Cs and Us may be eliminated and names applied to the major systems areas (Figure 33). While Figure 33 represents the completed information architecture, a final rearrangement of axes and use of two-way arrows allows preparation of a simplified graphic of the architecture. Figure 34 shows such a graphic with the same systems. Such illustrations have proved useful in management communications regarding the information architecture.

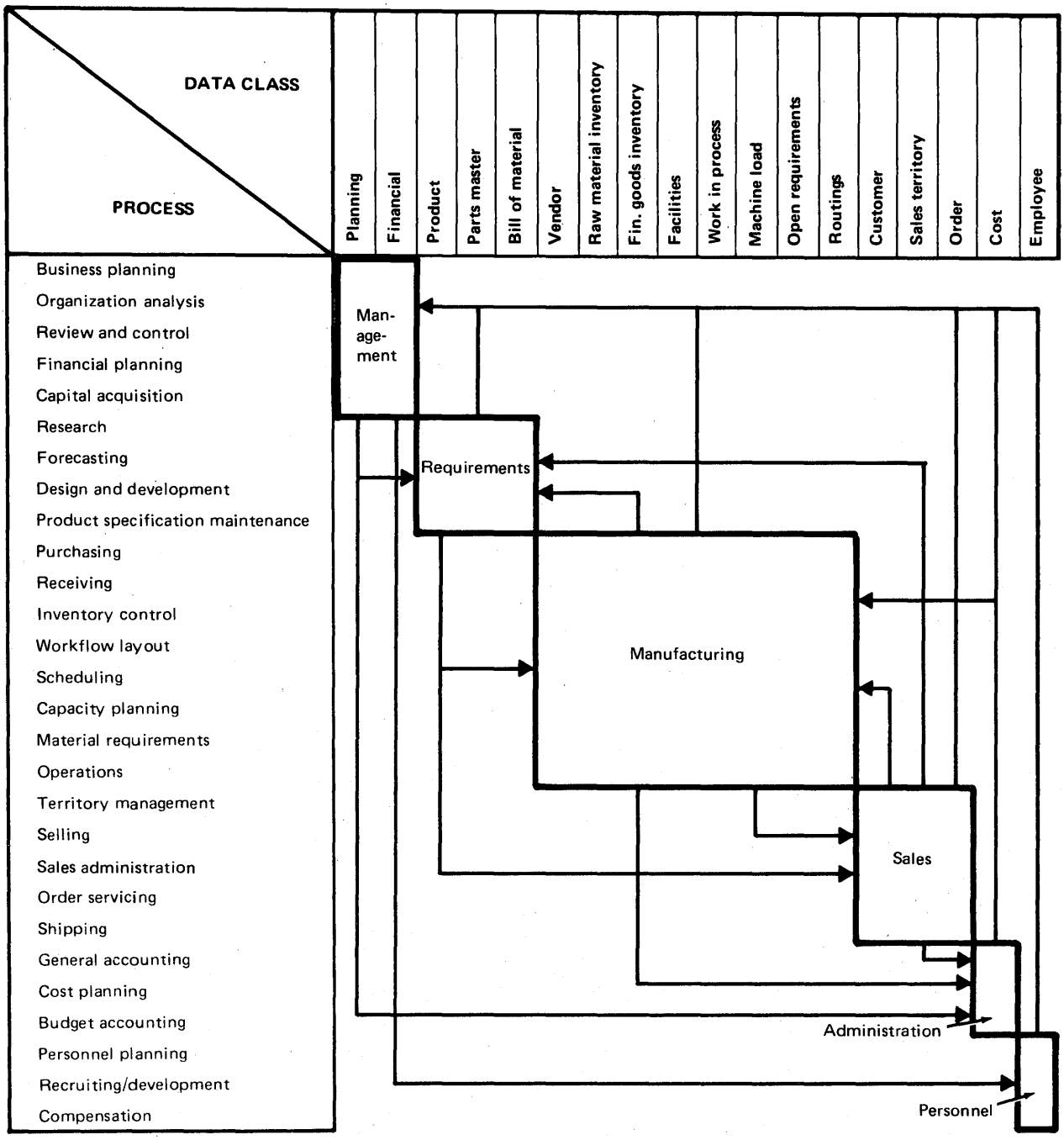


Figure 33. Information architecture

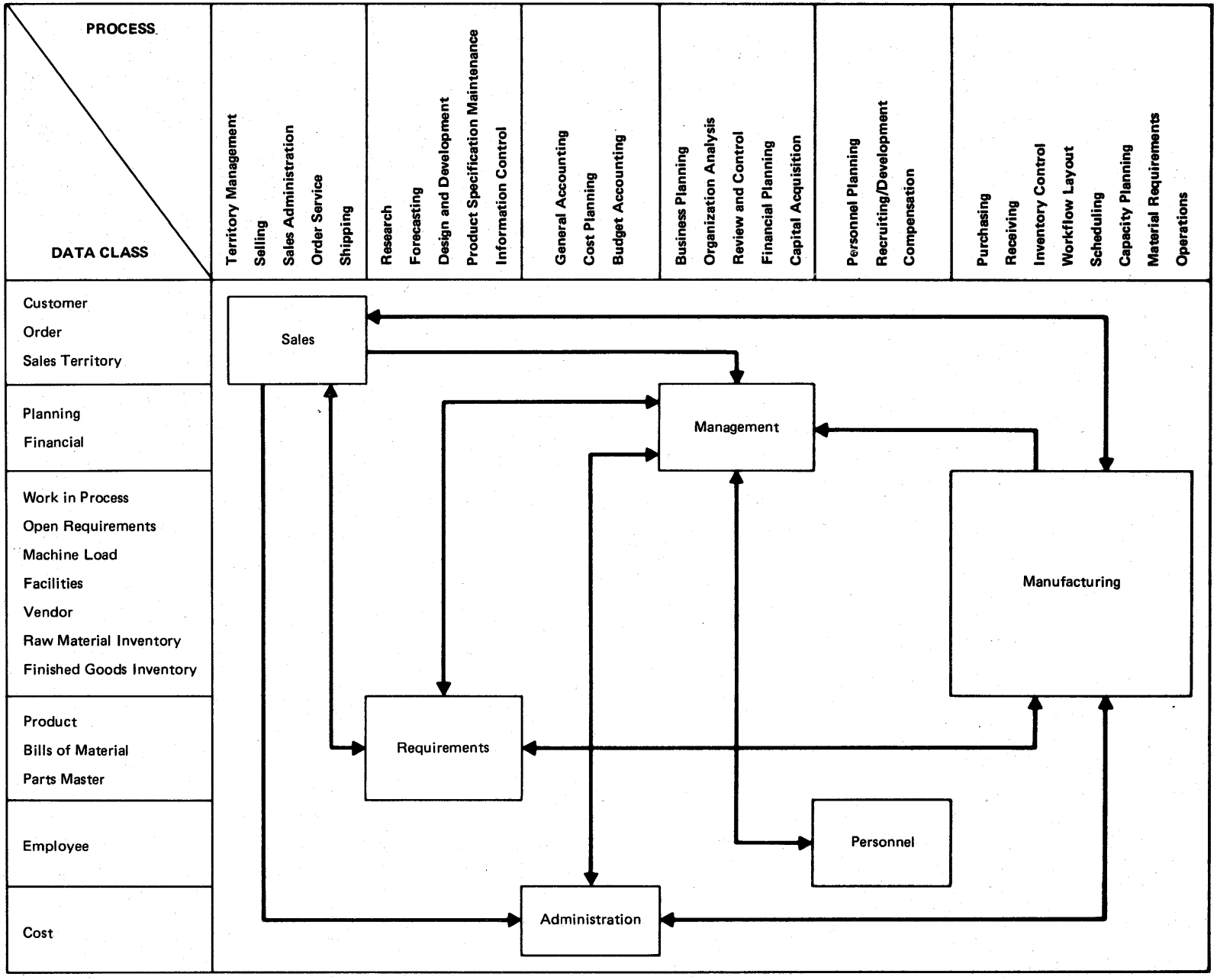


Figure 34. Graphic rearrangement of information architecture

Subsystem Identification

The first cut at identifying subsystems is again an arbitrary classification. Using the architecture development diagram such as Figure 30, define each C as a *create* subsystem. Define each U associated with a given process as a single usage subsystem.

With this starting point, logical combinations and/or splits can be made. Usage subsystems can be combined where use of the data is similar. Where create and usage subsystems are highly interdependent, a combination may be logical. Where a usage subsystem has dissimilar functions included, it can be split into two or more subsystems.

When the subsystems have been identified, a description of the functions of each (approximately one paragraph) should be written.

Analyzing for Prerequisites

With an outline of subsystems at hand, the final step is a prerequisite analysis, i.e., which subsystems must be in place before others can be created. By using the information architecture just developed and the team's understanding of the business, the interdependencies among subsystems can be analyzed. Once more, a matrix can be used to tabulate the results of the prerequisite analysis. The vertical axis of the matrix should list all subsystems, while the horizontal should list the prerequisite subsystems (Figure 35).

PREREQUISITE SUBSYSTEM / ALL SUBSYSTEMS	Territory analysis	Order status	Forecasting	Engineering design	Order specification	Purchasing
Engineering design	X					
Order specification						X
Bills of material				X		
Routings				X		
Product data control				X		
Sales analysis		X				
Order entry					X	
Business plan assessment			X			

Figure 35. Prerequisite subsystem analysis

Architecture Use

The information architecture identifies the systems and subsystems with respect to the data they create, control and use, and with respect to the business processes they support. The interdependencies have been analyzed as a basis for the prioritizing and planning that now take place. The information architecture provides an excellent foundation for analysis of distributed information systems requirements and data base planning, subjects covered further in Chapter 16. As each step is taken in development of the information systems, the architecture provides a blueprint showing where each piece of the system fits and what its relationship to the other pieces is.

Chapter 12. Determining Architecture Priorities

The team should select and recommend to management a portion of the information architecture to be implemented first. The purpose of identifying and recommending such a follow-on project is to begin implementation as early as practical. This will establish a "pay as you go" foundation for implementation of information systems.

The activity of selecting first subsystem(s) should rely primarily on a value analysis activity following the interviews. Its purpose is to produce a priority sequence of subsystem(s) that were identified in the information architecture activity of the BSP. The tasks to be performed are:

1. Determine selection criteria and document the technique to be used
2. Apply criteria to the subsystems
3. List subsystems in priority sequence
4. List dependencies or projects that are prerequisite to the first subsystems
5. Document or describe the recommended subsystems

Determine Selection Criteria

Since data is now being treated as a business resource, I/S projects should be able to be evaluated by management in the same way other business projects are evaluated. Therefore, it is recommended that the team use whatever justification technique presently exists within the organization for evaluating new projects. This will ease decision making as executive management makes the necessary trade-offs between, say, developing a new product, expanding a facility, making an acquisition, or implementing a major information system.

Some of the questions to be answered in determining the first subsystem(s) are:

- Will the subsystem provide a significant near-term saving and a substantial long-term return on investment?
- Whom will it impact, and how many people will be involved?
- Will it lay the groundwork for an initial data base structure for the architecture?

A method of determining logical priorities is to group the major criteria into four categories:

1. Potential benefits (value judgments)
   - Tangibles
   - Intangibles
   - ROI
2. Impact
   - Number of organizations and people affected
   - Qualitative effect
   - Effect on accomplishing overall objectives
3. Success
   - Degree of business acceptance
   - Probability of implementation
   - Prerequisites
   - Length of implementation
   - Risk
   - Resources available
4. Demand
   - Value of existing systems
   - Relationship with other systems
   - Political overtones
   - Need

Apply Criteria and List Systems

The major systems comprising the architecture can then be analyzed as potential first-subsystem candidates and ranked on a scale of 1 to 10 for each of the four categories above. Some type of pictorial representation can then be drawn to emphasize the most needed subsystems. Figure 36 is an example of this analysis.

List Prerequisites

During the architecture development activity, the team prepared a matrix to identify system prerequisites (Figure 35). Once a first system has been identified, the team should review that matrix. Any steps or projects necessary for successful implementation of the selected first system should be sequenced and listed. This will be necessary for developing a meaningful action plan. Prerequisite projects should then be clearly described and their relationship to the selected first system defined.

Document Recommended System

Finally, the recommended first system (or first subsystems) should be further documented. The system should be described in sufficient detail that the executive can properly evaluate it. The description should include an overview of system functions, major purposes and processes supported. It should identify any new technologies and/or special skills that need to be acquired or developed in order to implement or operate the recommended new systems. A general description of perceived benefits anticipated should also be included. The recommendation, documentation, and presentation should be in a format consistent with standard company practice.

Because of resource limitations, the definition of more than the very highest priority systems may be impossible initially. However, the same method can be used in making later selections. After the implementation of the first system has been completed, the priorities of the remaining system should be reassessed. For example, after the first four systems have been implemented, the system initially listed fifth may no longer be at the top of the list because the requirements and problems of the business have changed.

Expansions and Variations

Another method that may be used for priority selection is to focus primarily on financial justification. Using this technique, the team attempts to focus on tangible benefits as provided in the value statements during the executive interviews. This technique, called risk-benefit analysis, is described in Appendix H.

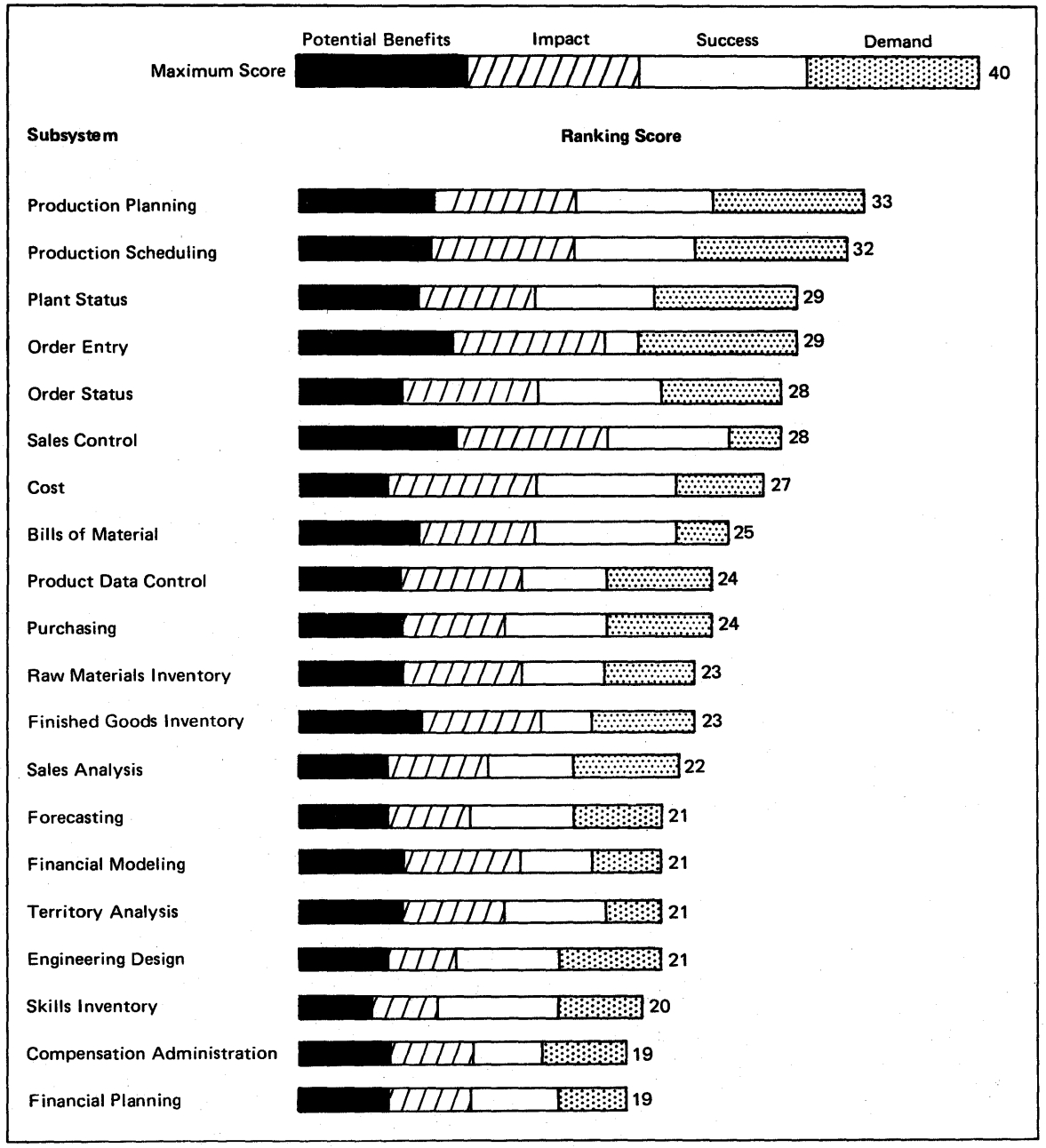


Figure 36. Sample subsystem ranking

Chapter 13. Reviewing Information Systems Management

The development and implementation of the information architecture cannot be accomplished without adequate planning, measurement, and control in the information systems functions. This chapter deals with those activities required to adequately review the Information Systems Management (ISM) function so as to recommend immediate changes and to specify ISM activities that are part of the follow-on projects.

The BSP study will not encompass all the ISM functions. The ISM analysis should be at the level of the I/S director's view and should include only the planning and control aspects of the major I/S processes. To put the ISM activities into perspective, this chapter starts with a definition of ISM and then goes on to the objectives of the ISM module in the BSP study.

Purpose of ISM in the BSP Study

The purpose of Information Systems Management is to manage the I/S resources for the most efficient and effective support of the business. The management system helps provide the continuous planning, control, measurement, and operation of the information systems function. An example of the total spectrum of ISM processes is represented by Appendix I.

ISM as Part of the BSP Study

The objectives of the ISM module are to:

- Study the facts relating to ISM produced in other modules of the BSP study
- Understand the findings and conclusions on I/S support of the business in relation to ISM
- Further specify I/S objectives
- Ensure that the first subsystems selected will be supported by the current or planned ISM functions
- Identify those ISM projects that have high priority and should be follow-on ISM projects

ISM Inputs

There are actions in other study modules prerequisite to performing the ISM activities in the BSP study:

- From study preparation:
  I/S mission and objectives
  I/S plans and strategies
  I/S measurements
  I/S organization
  I/S budgets
  I/S trends (resources, expenses)
  I/S inventory and locations (equipment, software, systems, personnel)
- From determining business requirements:
  Description of business objectives
  I/S support problems (from executive interviews)
  Major ISM problems/requirements from DP director's I/S review)
- From determining architectural priorities:
  New technologies and skills required to support the development of the first subsystem(s)

Flow of Activities in the ISM Module

Figure 37 gives an overview of the activities involved in the ISM module. The activities in italics are not part of this exercise but are included to help the reader see where ISM fits with the other activities. As noted in the figure, the required ISM changes are developed through three channels:

1. I/S objectives
2. Information architecture
3. Problem analysis
   I/S problems
   ISM problems

The changes required by each of these are then consolidated into a list for developing ISM priorities, which serves as input to the ISM portion of the action plan resulting from the BSP study.

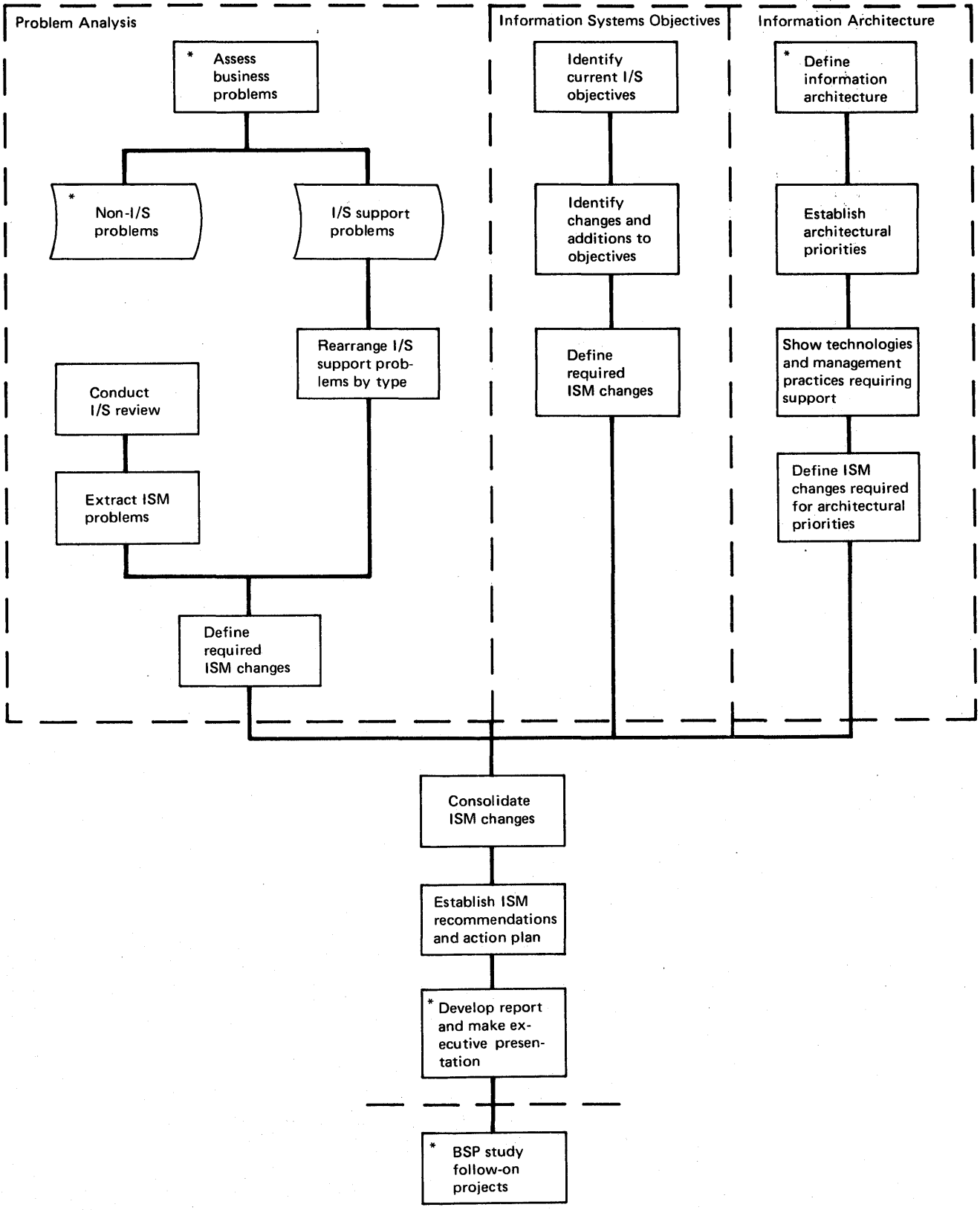
Compiling the I/S Objectives

The I/S objectives are required to provide the framework to provide consistency in the development and employment of I/S resources in support of the business. I/S objectives must be consistent with the objectives and management systems of the business so as to serve as a guide for the development of I/S plans and strategies in the BSP follow-on activities.

The current I/S objectives were documented in the BSP study preparation phase and discussed in the I/S director's presentation.

In determining the present I/S objectives to be modified and additional objectives that should be defined, the following list can be used as a guide. The objectives can be specified by defining the long-term view of each of these categories in information systems.

1. I/S Personnel
   Organization
   Skill mix
   Development and training



*Not involved in this exercise but added to the chart for purposes of perspective on ISM

Figure 37. Flow of ISM in a BSP study

2. I/S Finance
   Appropriations
   Expense budget
   User budget for I/S
3. User
   Capability
   Responsibility
      Development
      Data management
4. I/S Facilities
   Processing sites (data center – user locations)
   Equipment
   Software
   Communications network
5. Applications
6. Data

The following is a sample of I/S objectives following this approach:

Personnel

1. Provide staff assistance for planning and control to all levels of I/S line management.
2. Centralize major development and control functions with decentralized operations.
3. Develop I/S personnel who are specialists for each function of the business.

User

1. Provide maximum data processing capability and data access to users while maintaining central control.
2. Establish user responsibility for information requirements and validity of I/S outputs during the external design phase.

Following this procedure in compiling the I/S objectives should result in implied changes to ISM. These changes should be listed and reviewed with the I/S director and then held for later consolidation in the establishing of ISM project priorities.

Ensuring ISM Supports Architectural Priorities

As Figure 37 shows, the architectural priorities are a major input in determining the changes to ISM. The first data bases and information systems will probably require new technologies that must be provided and managed. They may also require new management practices. For example, a move to distributed data processing may require new practices regarding funding, chargeouts, control, and education. List these changes and save them for the consolidation.

Problem Analysis

Rearrange I/S Support Problems by Type

The third channel for identifying ISM changes is problem analysis. The problems that have been identified in the BSP study are separated into I/S support problems and non-I/S problems. Although the I/S support problems may have been aligned with business processes and with data, they should be rearranged at this time for better evaluation of their solutions through changes to ISM. The rearrangement should result in the categorizing of the problems by the following ISM processes for ease of defining and implementing changes: strategic planning, management control, I/S development, systems management, data administration, and organization and administration. Categorizing the problems by ISM processes will also provide direct input to the follow-on activities.

After rearranging the I/S support problems by type, check to see that those resulting from inadequate or nonexistent systems have been addressed by the proposed information architecture. This may identify changes to existing systems. Such information would be given to the I/S director for appropriate action. The other problems should be translated into required ISM changes. For example, the inaccessibility of existing data may require a change to the user function, giving the user direct access to selected data through his terminal. This would be in line with the objective to distribute more data processing capability to the users and require additional controls. After listing the required ISM changes, hold them for combining with the ones resulting from the next step.

Extract ISM Problems from I/S Review

During the kickoff, the director of information systems, or his representative, gave a review of the status of information systems in the company. Part of that review covered current problems in information systems management. There is a significant difference between these problems and those in the preceding paragraph. The I/S support problems may imply problems in ISM or may be attributable to other causes, whereas specific ISM problems may be spelled out during the I/S review. Categorize this set of problems also by information systems processes.

Because one of the major BSP objectives is the development of a long-range information systems plan, it should receive major emphasis during problem analysis and it must, of course, be one of the follow-on projects. Of equal importance with I/S planning is the subject of data management. Since data has been identified as a corporate resource, a major emphasis must be put on its management. This also will be one of the follow-on projects in ISM; both it and I/S planning will be elaborated upon more fully in Chapter 16.

Consolidating and Prioritizing ISM Changes

Consolidate all of the implied ISM changes from the three sources. Develop criteria to be used to rank the ISM changes, such as impact, potential benefits, resour-

ces involved, and probability of successful implementation. Apply weights for each factor and determine the total weight and priority associated with each of the ISM changes. This selection process should parallel that used in establishing the architectural priorities.

Developing Recommendations and Action Plan

Although the above activity will give priorities, do not establish schedules until this list is combined with actions required for other follow-on activities. The developing of recommendations and an action plan is covered in the next chapter.

ISM Outputs of a BSP Study

The following list summarizes the outputs that should result from the ISM portion of the BSP study:

1. Findings and conclusions
   Major ISM problem analysis
   ISM problems deduced from the I/S support problems
2. I/S objectives
3. Definition of high-priority ISM projects
   First systems support requirements
   Projects addressing major ISM problems
   Immediate actions recommended
4. Action plan for follow-on projects

Chapter 14. Developing Recommendations and Action Plan

Specific BSP study recommendations may center on the areas of:

1. Information architecture
   a. Detailing the subsystems of the information network
   b. Interim improvements to current systems
2. Information systems management, including:
   a. Data management to control the data resource of the organization
   b. Information systems planning process to ensure that the information architecture remains responsive to changing conditions
   c. Measurement and control to provide a system of procedures, controls and structure for future implementations
3. Architecture priorities – development of the first system to be implemented

For each recommendation, there may be an associated project, and for every project an action plan should be developed identifying the key decisions and activities required to help management provide proper direction. The action plan should give the project manager a firm basis for a smooth transition from the study work product to the particular project. The plan should describe the costs, potential benefits, and schedules for each project in enough detail that an informed executive decision can be made to approve or reject the project.

Each action plan should include the following:

Scope of project. Describe subject of project, including size and purpose.

Deliverables. List and define each output or result expected of the project.

Schedule. Identify expected start and concluding dates as specifically as possible.

Potential benefits. Describe anticipated benefits or reasons for doing the project.

People and skills. Describe manning of project in terms of management as well as staffing.

Tools and techniques. Describe any required practices or methods as specifically as possible.

Training. Describe specific orientation, education, and study necessary for successful execution of the project.

Communications. Identify coordination, liaison, interface points, or functions as well as documentation requirements.

Logistics. Define materiel and facility support necessary and indicate when it is needed.

Control. Define project control methods and responsibilities as well as review/approval requirements.

The amount of emphasis placed on the recommended follow-on projects varies greatly from one organization to another. Normally, multiple follow-on projects will run concurrently. The number of simultaneous system projects varies with the needs of the organization, the resources and time available to perform each project, and other factors.

The completion of the activities above enables the BSP study team to proceed to its final activities: preparation of the study report and presentation of the study results to executive management. Thorough preparation of the action plans, potential benefits, and costs enables the executive sponsor to evaluate the recommendations. The study team can then ask for and expect a prompt approval of the recommendations and a prompt commitment by management to implement them.

Chapter 15. Reporting Results

Having defined the information architecture, identified the architecture priorities, reviewed and assessed I/S management, and developed recommendations and the action plan, the BSP study team is ready to complete its mission by preparing the study report and preparing and delivering an executive presentation. The purpose of the report and presentation is to obtain further executive management commitment and involvement for implementing recommendations from the BSP study.

The following activities are performed in preparing the study report and executive presentation:

- Report outline is prepared
- Report is written
- Executive presentation medium is determined
- Executive presentation is prepared and delivered

Report Outline

During the initial steps of preparing for the study and developing a work plan for conducting the study, the team prepared a preliminary report outline. Since the report now materializing from that outline is to be a consensus of the entire team, each of its sections should be reviewed by each of the members so that the final document reflects all their comments.

The report may be structured in many ways, depending upon precedent and methods of presentation within the business conducting the study. However, to assist the team in its consideration of pertinent areas, an extensive list of topics is presented in Appendix J.

The most significant findings, conclusions, and recommendations should be summarized in the first few pages of the report for the use of top management. Supporting details should be included later and in the appendices for other members of the organization and for team members who will participate in future follow-on activities.

Report Preparation

The primary writing responsibility for each of the sections of the report was assigned during study preparation. As the study progresses, changes, additions, and deletions can be made to the preliminary outline. By the time the executive interviews have been completed, agreement should have been reached on the final table of contents, and the individual study team members should have available to them most of the information needed to complete their assigned sections. The study team leader usually assumes the responsibility for writing the background and overview because much of this material comes directly from the orientation information presented to the team at the kickoff meeting.

The conclusions, recommendations, and an action plan should be reviewed with the executive sponsor before the team drafts the final report. Controversial areas or areas of high impact on the business may be reviewed with the executive involved, to determine how best to present the recommendations.

Presentation Medium

The principal factors to consider in determining how the report should be presented are the type and size of the audience and the accepted ways of making such a presentation in the particular business environment. Consultation with the executive sponsor early in the study to obtain his advice on this subject can be most helpful in establishing the proper direction.

If the presentation is made to a small group, easel flipcharts are adequate and popular. If the audience numbers more than a dozen, viewgraphs or slides should be considered. If slides are to be used, adequate time should be allotted to have them prepared, whether in-house or by an outside vendor.

Executive Presentation

The executive presentation can be developed completely from material contained in the final draft of the report. The principal aims of this presentation are to inform management of the study's findings, make recommendations, and secure approval of the action plan.

The presentation should be consise – preferably no longer than an hour. It should be logical and factual and should end with recommendations for the follow-on activities. For example, it may take the following form:

1. Introduction
   Background and overview
   Objectives
   Scope
   Study team
2. Study approach
   Business and I/S review
   Business processes
   Business/information systems relationships
3. Major problem identified
4. Conclusions and recommendations
   Information architecture and priorities
   I/S management requirements
5. Action plan for follow-on project activities
   Description(s)
   Deliverables
   Resource requirements
   Schedules

Chapter 16. Overview of Follow-On Activities

The BSP study ended with the development of an action plan for the follow-on activities and a presentation for management approval to proceed in the execution of that plan. This final chapter of the BSP Planning Guide gives an overview of the follow-on activities and serves three purposes:

1. To relate the follow-on activities to the BSP study
2. To show how to capitalize on the results of the BSP study
3. To further explain the major follow-on projects

The following section helps in putting the follow-on activities in perspective and in emphasizing their importance. It also explains how to get the maximum use of the output from the BSP study. The latter part of this chapter attempts to give enough of an understanding of the follow-on projects to allow for scheduling them in the action plan and to help preparing for them.

Perspective on Follow-on Activities

Relation of BSP Study to Follow-on Activities

The follow-on activities are a continuation and expansion of the major activities in the BSP study. The major thrust of the study was one of understanding, developing findings and conclusions, and making recommendations. While the thrust in follow-on projects is still to understand, greater emphasis is put on detailed definitions and planning.

There is a great need for communications among the project teams if project implementation is to be successful. Therefore, the information systems director should take overall responsibility for the projects, since the functions performed during the follow-on activities are a part of the ISM responsibilities. Because the follow-on activities build upon the results of and the information gathered in the BSP study, there is a need for continuity of team members. At least one person on the BSP study team should have been chosen from the data processing function, with the idea that he would remain for the follow-on activities.

The functions performed by the executive sponsor for the BSP study should be performed by a steering committee for the follow-on projects, unless there is a management committee that will perform them.

Business processes continue to be the vehicle for understanding detailed business requirements and for further defining the information architecture with special emphasis on the definition of the first system.

Preparation for Follow-on Activities

Because of the variations in the findings and conclusions that may result from BSP studies, the follow-on activities and the emphasis placed on each of them will vary from one BSP study to another. For purposes of this discussion, the following assumptions are made:

1. ISM functions must be changed or added to provide a controlled environment for the development and implementation of the information architecture identified in the BSP study. A detailed information systems plan will be developed that will reflect these planned changes.
2. The information architecture must be further defined and data bases identified.
3. A first system has been chosen for development and implementation.

Orientation of Teams

Before the beginning of each of the follow-on projects, the I/S director should provide orientation for project team members. Since many of the team members will not be familiar with BSP, its principles and objectives should be summarized. It is very important that everyone on the project teams understand exactly how the BSP study was conducted and become familiar with the outputs so as to be able to build upon them.

A review of the BSP study report for the areas to be studied in the follow-on projects will help to determine whether team members need special education. A specification of tools and techniques may also reveal the need for special education. If required, appropriate classes can be scheduled on an individual basis. If the I/S director was not a member of the BSP study team, it might be advisable for him to attend the IBM Information Systems Planning course.

The following is a sample list of topics for project team orientation:

- Introduction by the sponsor
- Objectives of the orientation
- Information systems concepts and perspectives
- Data base concepts
- Overview of the BSP study methodology
- Detailed discussion of the BSP study
  - Business environment
  - Objectives
  - Major processes identified
  - Major problems
  - Current I/S support for the business
  - Interviews
  - Information architecture
  - Major findings and conclusions
  - Recommendations
- Introduction to the follow-on activities
  - Relation to the BSP study
  - Relation to the BSP study deliverables

Discussion of deliverables from the follow-on activities
Explanation of follow-on projects
Introduction of tools and techniques
Introduction of preparation activities
  Activities already performed
  Activities to be performed by team members
Interviewing strategies and selection of interviewees
Use of matrices
Pilots of forms, tools, techniques and interviews
Introduction to HIPO and its use in the follow-on projects
Assignment of responsibilities
Development of task descriptions by team members
Explanation of project control systems

Information Systems Management

ISM is the keystone of effective support of the business by information systems. It can be defined as the management of the information systems resources for the most efficient and effective support of the business. The importance of continual emphasis on ISM is summarized by the following statements:

- Development of the information architecture will take place over a period of years.
- Changes to business strategies and plans as well as I/S technology will be continual during the development of the information architecture.
- The processes of managing I/S will have to be refined and changed continually to properly plan, measure, and control required I/S resources.
- The BSP study is a one-time effort that should be followed by continual I/S planning to fully capitalize on the results.

ISM in Perspective

As covered in Chapter 13, the ISM follow-on projects will emanate from (1) requirements to support I/S objectives, (2) changes resulting from the development and implementation of the first system, and (3) recommended changes to solve I/S support problems and ISM problems.

From this it is safe to assume that the recommendations included:

1. Emphasis on information systems planning and control and on data administration.
2. Some close-in projects, such as the establishment of a steering committee and refinements to project control. Capacity planning is also a natural follow-on to a BSP study since it examines the data processing capacity and determines whether changes are required to accommodate the architectural priorities or to solve some of the I/S support problems.
3. A major project(s) in ISM, e.g., establishing an action plan to move to distributed data processing.

Perhaps the most important action to be taken after the BSP study is to decide what person or group of persons is responsible for continuing the I/S planning using the BSP study as a base. While the BSP study culminated in an approved action plan, the overall objective of an ISM project will be to develop a long-range I/S plan that will direct the design, development, and implementation of an information architecture. It should include sufficient detail on projects, resources, and schedules to guide all levels of management on what is to be done, when, and by whom in the organization. Since the long-range I/S plan is an integral part of the business plan and is prepared with full management involvement, it should help to provide that the I/S resources of the business will be used to effectively support the business.

Also, since data management is a complex area requiring long lead times, the data administrator should be decided upon as early as possible so that this function can be properly coordinated.

The importance of I/S planning and data administration cannot be overemphasized, and they will nearly always be a part of the follow-on activity. The activities will not be explained further here since they are covered thoroughly in IBM, GUIDE, SHARE, and trade publications.

Some of the close-in projects should be done immediately after the BSP study recommendations are approved and before most of the follow-on activities are started. The establishment of a steering committee and a project control system are excellent examples since a steering committee should be available to direct the follow-on activities and a project control system should be in place to help the I/S director adequately control and coordinate the activities.

The major ISM follow-on project will probably be a long-range activity such as I/S planning or data administration or a combination of both.

Because of the size of these projects and their interactions with all the I/S processes, it is important to fully understand all the functions of ISM before undertaking any recommended change to any part of ISM, just as it was important to fully understand the business before starting to fulfill the information requirements. Some mechanism should exist to get the broad view of ISM, and BSP can be used as that mechanism. You may treat I/S as a business-within-a-business and apply to it the same BSP techniques that you have applied to the business in which it is located.

Information Systems as a Business

Many of the activities for performing a BSP study in the I/S function have already been accomplished:

- Facts relating to information systems were gathered as part of the study preparation phase.

- ISM responsibilities, activities, and problems were identified by the I/S director during the kickoff.
- Many of the findings and conclusions have already been put together as a result of examining the I/S facts and the problems.
- A first ISM project has been identified and an action plan established.

While some of these activities will have to be expanded, they make a significant start in understanding the whole I/S function. The following identifies other steps that should be performed:

1. Defining ISM processes. Appendix I suggests the processes that take place in ISM. This may be used as a checklist to identify the ISM processes. Otherwise, you may wish to identify the information systems resources and the activities and decisions found in their management cycle. The following is a list of resources to be considered:
   Programs and systems
   Functional modules
   Data bases
   Hardware/software/communications facilities
   User facilities (terminals, languages, data bases, etc.)
   Physical facilities
   Finance
   People
2. Analyzing relationships of organization, processes, information systems, and data. This is an exact parallel to the development of the matrices to show relationships in the business BSP study, except that the information systems are those that support the I/S functions, such as equipment utilization systems and chargeout systems. The data is that needed to support these and other systems used to manage the I/S function.
3. Interviewing. The interviewing in ISM will normally be with the upper two levels of information systems managers, selective interactive users, the executive to whom the I/S director reports, and selected functional users.

The remaining steps are the same as the BSP methodology for the business and should be conducted by a small team led by the individual responsible for I/S planning or another person with a broad responsibility in I/S.

The BSP study of the I/S function may be done as part of the ISM follow-on project, as suggested. It should also be considered as an effort that can be made either concurrently with the business BSP study, before it, or immediately after it and before the start of any follow-on projects.

As an activity before the business study, the I/S study provides experience in the methodology, offers an excellent view of I/S as input to the business study, allows an early start on ISM projects, and can serve as a selling tool if some executives are skeptical of the methodology. It must be recognized that a major deficiency exists in the understanding of part of the I/S environment, which in this case is the rest of the business.

BSP is so demanding of a team's time that running the two studies concurrently will require two teams, closely coordinated. The added emphasis on ISM may detract from the major goal of understanding the business and may give the entire study a much greater flavor of an I/S project than is desired. The major advantage is the ability to relate I/S problems directly to ISM problems and make sound recommendations on ISM in the action plan and report of the business BSP study.

Ideally, the I/S study should be done immediately after the business study, since (1) the required inputs are readily available, (2) the momentum will carry over from the business study, and (3) the best environment will exist for conducting all the follow-on activities.

Information Architecture

The amount of follow-on effort required in the architecture area depends on the level of detail in the BSP study. If the information architecture was not completely defined as outlined in Chapter 11, the basic architecture definition should be completed as the beginning of a follow-on project.

The architecture refinement to be accomplished in a follow-on project should include a confirmation of the major I/S groupings, the subsystem breakout of each system, subsystem interrelation, and data flow among subsystems.

Several other activities should be included in the information architecture project:

- Examination of current data processing systems to determine how they can evolve (provided they can at all) into the new systems architecture
- Establishment of a continuing link between the architecture and the business plan to ensure that the I/S plan will be based upon a viable information architecture
- Documentation of alternative architectures that were tried or investigated and rejected, with the reasons for rejection
- Evaluation of the technical implications of the information architecture, including control systems, DB/DC requirements, and potential distribution of both information and systems

Architecture Refinement

Using the information architecture defined in the BSP study, a description of each subsystem should be prepared. Each description should include the purpose of the subsystem, business problems addressed, data

created and used, dependencies on other subsystems, general requirements for implementation, and priority of the subsystem with respect to all other subsystems.

Current Systems Examination

For data processing systems currently in use or under development, a careful examination should be conducted to determine how each one relates to the subsystems described in the information architecture. Possible modifications to current systems should be documented with respect to interfacing them to the future architecture. Where modified systems could be used in lieu of new subsystems, a description should be included in the architecture documentation. For systems already under development, an evaluation should be made of possible modifications to make the developing system compatible with the new information architecture. Analysis should be made of the impact on current development schedules versus the avoidance of modifying the system after implementation, keeping in mind present commitments and future priorities.

Data Base

Integral to information architecture definition in the BSP study were the data classes supporting the business processes. A logical grouping of related data classes will yield the set of data bases that will support the architecture implementation.

A data base can be defined as a nonredundant collection of interrelated data items processable by one or more applications. Some of the terms in the definition itself may need explaining:

- *Nonredundant* means that individual data items appear only once (or at least less frequently than in normal file organizations) in the data base.
- *Interrelated* means that the files are constructed with an ordered and planned relationship that allows data elements to be tied together, even though they may not necessarily be in the same physical record.
- *Processable by one or more applications* means simply that data is shared and used by several different subsystems.

Development of a data base has some obvious benefits. By consolidating files, the user can obtain better control of data and reduce storage space and processing time. Equally important are the resultant data synchronization and timeliness. Use of a single information source makes processing more accurate because all subsystems refer to the same data.

A data base system can help overcome some of the complexities of data management. It can provide additional data relationships while minimizing storage redundancy. Figure 38 illustrates how a data base system can support subsystem needs independently and currently.

A comparison of the data base environment with the traditional approach to systems development and maintenance reveals the advantages of the data base concept. In the traditional approach, a system is usually designed, programmed, tested, and then implemented as a total entity. Its advantages cannot be realized by the end user until the entire system is completed. The amount of time involved can cause frustration, since business requirements cannot be kept frozen long enough to avoid changes, delays, and false starts. Also, when data or logic changes are required, considerable testing may be necessary to determine how the change affects other programs or systems functions.

By contrast, the data base approach allows a gradual transition from existing systems to online, transaction-driven systems. The data base is created gradually, with just a few transactions implemented at a time. Current data base techniques facilitate this type of data base and system implementation. With gradual implementation of transactions, user department signoff can be obtained more easily and the user can enjoy the benefits earlier. This approach also helps overcome the problem of not being able to freeze business requirements and technological advances during the development cycle. Changes that must be made along the way impact individual transactions or become new transactions themselves. Changing data needs can be accommodated without affecting programs that do not use that specific area or segment of the data base. Thus, the data base environment can be a better way to accommodate change, deliver benefits to the user, and control development costs.

Distributed Information Systems

The general purpose of distributed information systems is to provide the user with a level of computing resource best suited to his operational requirements. The elements that can be considered for distribution include hardware, program execution, program development, and data. Degree of distribution can vary from totally centralized to totally decentralized. The information architecture defined in the BSP study can provide a good foundation for the additional planning necessary to address I/S distribution requirements.

If the information architecture follow-on project is to add distributed I/S parameters to the architecture, the project team must:

- Thoroughly understand the degree of distribution of each element
- Understand the arguments for and against distribu-

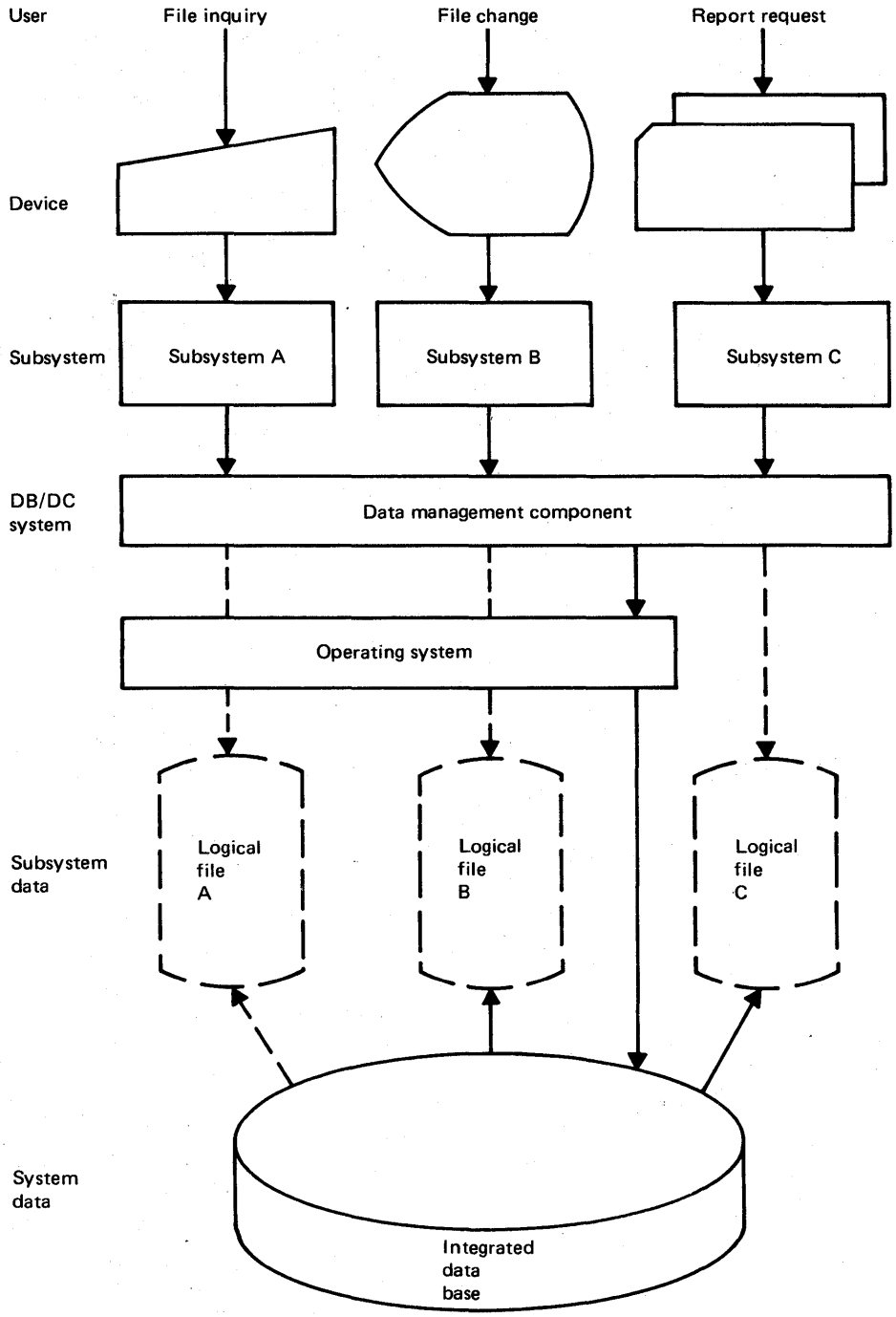


Figure 38. Data base system

tion of the various elements

- Be able to put into perspective all the factors that affect distribution and sharing of data processing resources
- Appreciate the need for a long-range I/S plan and for development of a facilities plan to support the I/S plan

Several of the matrices developed in the BSP study can be very useful in developing the architecture extensions with respect to distribution. The process and data flow analysis should be extended to include physical locations for systems and data requirements. Location/organization, location/process and location/data matrices should be prepared. A process/data matrix for each location (or group of similar locations) should be prepared with additional parameters on the axes to include data use, security, auditability, data occurrence (all or partial), activity volumes, response required, and criticality. Figure 39 shows this type of matrix for a manufacturing plant site.

These additions to the architectural description of the information systems can then be input to the individual subsystem requirement studies to determine detail distributed systems requirements. They will also give an overall feel for the applicability of distributed systems to the information architecture.

Developing the First System

The BSP team has recommended that a particular high-priority system be developed and implemented first. As development of that system begins, care should be taken that this system is not developed "by itself." The BSP study has set a certain direction for implementation of systems. This first development and implementation must support the business processes and must:

1. Fit properly into and interface with the other (future) systems of the overall architecture described in the BSP study
2. Provide for proper implementation of the appropriate data base(s)

As described in the ISM section of this chapter, these concurrent projects must be carefully managed (ISM) to ensure that they lead toward an integrated whole rather than perpetuate "separatist" or "standalone" applications development.

System development is a complex process. It requires technical expertise, effective communications, and skillful handling of conflicting objectives of users, management, and data processing.

Technical Factors

There is no doubt that developing information systems is more complex today than in the past. Factors such as data security, data integrity, data communications, rapid availability of large amounts of data, and backup and recovery requirements complicate the tasks that must be performed on a project. They also add to requirements for skilled personnel to perform such tasks.

In many areas technical risks may be reduced by incorporating appropriate hardware/software products, productivity techniques, and procedures. An investment of time in evaluating existing products and applying them to the recommended system will reap ample rewards in a better system implementation.

Effective Communication

Effective communication is indispensable to successful system development, which entails the communication and translation of management and user business requirements into achievable data processing solutions.

Only users can determine the business requirements of the system to be developed. Their involvement and continued participation are, therefore, essential.

Developers sometimes try to second-guess the needs of users and to create systems they believe will do the job. More often than not, this approach is unsatisfactory. While the *technical* aspects of such a system may be sound, the real *business* needs of the organization may not be addressed or met.

Users and developers need a mutual understanding of what is to be done and a commitment to their respective responsibilities. The development process itself must ensure communication and commitment between the two groups.

Communications may be greatly facilitated by the use of standardized documentation techniques such as HIPO, structured walk-throughs, and the like. These not only reduce misunderstandings but contribute to increased productivity, which in turn should speed up implementation of the system or application. Where appropriate, such aids should be evaluated, adopted, and incorporated in the development project.

Priorities and Conflicts

The need to set priorities for conflicting objectives is crucial. Conflicts can make even simple situations complex and can cause many serious project difficulties.

Even before a project is under way, the new system must compete with the demands of trained personnel to maintain old systems. Application development resources are in short supply, and experienced development skills may be hard to find because everybody has a backlog of applications waiting to be developed.

The project manager, therefore, must be qualified both in project management techniques and in the business area to be supported by the first system.

Location: Plant Site DATA CLASS / PROCESS	Product	Bill of Material	Parts Master	Routings	Planning	Facilities	Employee	Vendor	Raw Material Inventory	Finished Goods Inventory	Work in Process	Machine Load	Open Requirements	Customer	Sales Territory	Order	Financial	Cost		Security	Auditability	Volume	Responsiveness
Design and Develop.		A	A											A								L	L
Product Spec. Maint.		A	A					A												C		L	M
Information Control	A			C																	C	L	M
Planning																							
Research																							
Forecasting																							
Financial Planning					A		A				A						A					L	L
Capital Acquisition																							
Funds Management	A						A									A	A				A	M	M
Workflow Layout	A			A		C															C	M	H
Maintenance						A					A											L	L
Equip. Performance						A														A		M	M
Personnel Planning							C										A			C	C	M	L
Recruiting/Development							A															L	M
Compensation							A										A			A		L	L
Purchasing								A										A				H	H
Receiving								A	A													M	H
Inventory Control									C	C	A										C	M	H
Shipping	A									A						A						H	M
Scheduling	A					A		A			C	A								A	C	M	H
Capacity Planning				A		A		A				C	A							A	A	M	H
Material Reqmts.	A	A											C								C	M	H
Operations				A							A	A	A									L	H
Territory Mgmt.																							
Selling																							
Sales Administration																							
Order Servicing	A													A		A						H	H
General Accounting							A	A						A			C				C	H	L
Cost Planning								A								A		A				L	L
Budget Accounting					A		A				A						A	A				M	L
Business Planning					A												A					L	L
Organization Analysis					A																	L	L
Review and Control					A												A					L	L
Risk Management																	A					L	L
Use	A	A	A	C	A	C	C	A	C	C	C	C	C	A		A	C	A					
Security	A				A		A	A						C	A	A	A	C					
Auditability	A				A																		
Data Occurrence	T	T	T	T	T	T	P	P	T	T	T	T	T	P		P	P	T					
Currency	I	I	S	S	L	L	L	O	I	I	I	S	O	O		S	L	O					

Use and Audit: A = Access only C = Access and Change
Security: A = Unauthorized Access protection
C = Unauthorized Change protection
Occurrence: T = Total record needed
P = Partial record needed
Currency: I = Immediate; S = Same day
O = Overnight; L = Longer
Volume/Response: H = High/quick; M = Medium; L = Low/slow

Figure 39. Distributed information requirements analysis

Ample education, documentation, and products are available for both. A thorough analysis of support should be made and a technical support plan should be put together to utilize the education, documentation, and products wherever possible. You should work with your IBM marketing representative to develop such a plan.

The project manager and appropriate team members should be thoroughly prepared in these areas before the start of the project. This should result in effective project management, which in turn will reduce risks and optimize the business value of the first implementation.

Appendix A. Sample Executive Announcement Letter

To: All executives

Subject: Business Systems Planning Study

I am sure all of you are aware of the dynamic nature of our business. Our success in the future will depend greatly on how we plan and react to the business environment. I am pleased to inform you that we are initiating a major effort to analyze our current and future information needs. I have authorized a study group that will conduct an in-depth study on how we use information and its relation to our business.

The study project will be directed by Ms. Marilyn Jordan, with other company personnel involved on both a full-time and part-time basis. Assisting us in an advisory capacity will be personnel from the IBM Corporation. We will be using a methodology called Business Systems Planning (BSP), which has been helpful to other companies in evaluating and planning for their information requirements.

Key to the study's success is the precise identification and clear statement of our individual and collective information needs. To this end, the study team will want to discuss our information needs with us in detail in a series of individual interviews. It is essential that each individual who is asked to participate in an interview be completely candid in discussing problems, needs, and plans with the team members. You will be contacted by Ms. Jordan in the near future to set up interview dates and times. I urge you to give full cooperation in this valuable enterprise and work as closely and cooperatively with the study group as possible.

I am confident the study will be of tremendous value to the company and help us accomplish our overall objectives.

Sincerely,

Edward J. Bissel
President

EJB/rth

Appendix B. Sample Interview Confirmation Letter

To: Mr. H.R. Zimmer
Vice President of Planning

Subject: Business Systems Planning Study

Mr. Bissell's recent memorandum announced the initiation of an in-depth information systems planning study for our business. The objectives of the study team are to:

- Develop an overall understanding of the business
- Understand how information systems currently supports the business
- Identify an information architecture that will support the business
- Identify the first or most needed subsystems within the network
- Make recommendations for improvements
- Develop an action plan

To assist the study team in this effort, we intend to interview the key executives of our business. Each interview is estimated to take 2-4 hours. I have Wednesday, April 9, at 1:00 p.m. scheduled on your calendar for me and other selected members of the BSP team to meet with you. The meeting will be in the former EDP office at the south end of Building 2.

The purpose of the meeting is for us to learn about your area of responsibility, the information you consider essential to manage your area, and the problems you currently have in obtaining this needed information. The discussion of these topics will enable us to better understand your information needs to evaluate the current information systems, and to define systems that are responsive to your information needs. Attached is a list of topics we wish to discuss with you.

If you have any questions before our meeting on April 9, please call me. Thank you for your cooperation.

Sincerely,

M.C. Jordan, BSP Study Team Leader
Attachment

Appendix C. Examples of Process Groups and Processes by Industry

Insurance

Management Planning
- Corporate direction planning
- Long-range planning
- Business planning
- Acquisition/ventures planning

Product Management
- Managing the book of business
- Product service monitoring
- Product reevaluation

Control and Measurement
- Financial planning
- Operational planning
- Performance evaluation

Product Development and Maintenance
- Product design
- Pricing
- Product goals and measurement
- Product implementation

Facilities, Equipment and Supplies
- Facility planning
- Facility services management
- Equipment and supplies management
- Warehousing and distribution

Merchandising
- Lead development
- Selling
- Customer qualification
- Risk engineering
- Establishing and maintaining customer record
- Billing and collections
- Customer servicing

Product Service
- Insurance
- Insurance claim evaluation and disposition
- Non-insurance processing service
- Non-insurance professional service

Financial
- Cash management
- Asset accounting
- Expense allocation
- Claim reserves
- Tax processing
- Corporate books and ledgers admin.
- Investment management

Administration
- Legal services
- External relations
- Advertising
- Auditing
- Information development
- Operational support
- Manpower management
- External services management
- Systems planning
- System development/maintenance and operations

Finance

Management Planning and Control
- Objectives planning
- Forecasting alternatives
- Measurement and control
- Organization
- Policy setting
- Resource allocation
- External relations

Product Development
- Review and approval
- Resource evaluation
- Strategy development
- Education development
- Pricing

Marketing
- Market definition
- Market research
- Advertising and promotion
- Public relations
- Product implementation
- Competitive analysis

Money Management
- Investment management
- Money market instruments

Customer
- Investigation and acceptance
- Account establishment
- Account control
- Account maintenance
- Account termination

Funds Transfer Services
- Letter of credit
- Money transfer
- Bond transfer
- Stock transfer
- Loan
- Deposit/withdrawal checking
- Collections
- Lock box
- Automatic dividend reinvestment
- Foreign exchange
- Cash management

Trust
- Accounting services
- Asset management

Operations
- Communications
- Data processing
- Transaction servicing
- Inquiry servicing
- Corrections
- Mail

Finance
- Budget planning and control
- Financial analysis
- Asset management
- Liability management
- Capital management
- Financial reporting

Personnel
- Planning
- Recruiting and hiring
- Training
- Wage and salary administration
- Employee relations
- Benefits management
- Career development
- Retirement or separation
- Government compliance

Legal
- Litigation
- Tax consequence advising
- Contracts review
- Legislation impact analysis
- Legal compliance review

Administration
- Accounting
- Audit
- Facilities
- Regulatory compliance
- Taxes
- Payroll
- Security

Process (Chemical)

Planning
- Strategic planning
- Market research
- Technical feasibility
- Economic analysis
- Forecasting
- Resource requirements

Product Development
- Exploration
- Engineering development
- Licensing
- Engineering design
- Construction

Marketing
- Sales forecasting
- Advertising/promotion
- Pricing
- Selling/contracting
- Order entry
- Customer service
- Sales analysis

Manufacturing
- Production forecasting
- Scheduling
- Inventory
- Plant operations
- Packaging
- Warehousing
- Shipping
- Maintenance
- Quality control
- Product cost control

Distribution
- Carrier and rate negotiations
- Supply/demand planning
- Order processing
- Rating and routing
- Terminal operations
- Warehouse planning/operations
- Fleet planning
- Fleet operations
- Inventory control

Financial
- Financial planning
- Financial analysis
- Capital transaction and control
- Budgeting
- General accounting
- Cost accounting
- Taxes
- Government report
- Payroll

Administration
- Personnel development
- Salary and benefits administration
- Labor and personnel relations
- External affairs
- Legal
- Insurance
- Information services
- Facilities services

Process (Paper)

Product Development
- Product design
- Raw material requirements
- Facility planning
- Market forecast
- Financial requirements
- Market planning

Marketing
- Sales planning
- Product plan
- Sales analysis
- Order entry
- Customer services
- Pricing

Production
- Requirement planning
- Production scheduling
- Raw material planning
- Receiving
- Production reporting
- Quality control
- Inventory
- Shipping
- Maintenance

Engineering Support
- Project engineering
- Environment
- Energy requirements
- Standards
- Material handling

Financial
- Cash management
- Budgeting
- Capital expenditures
- Cost analysis
- Financial reporting
- Payroll
- Customer billing
- Accounts receivable and payable
- Audit

Administration
- Purchasing
- Personnel services
- Traffic
- Salary administration
- Information services
- Legal
- Stockholder relations
- Public affairs

Industry Relations
- Labor relations
- Personnel development
- Safety

Manufacturing

Product Development and Application
- Technology development
- Product application
- New product
- Old product
- Application engineering
- Specifications
- Drafting and records
- Product performance

Product Planning
- Determination of business case
- Evaluation of business case

Marketing
- Marketing planning
- Market research, market development
- Pricing
- Publications, advertising, promotions
- Sales analysis and forecasting
- Warranty policy and other software
- Market operations
- Distribution network
- Field sales and service
- OEM sales and service
- Order entry

Financial Management
- Funds management
- Cash
- Short-term financing
- Long-term financing
- Financial control
- Budget/expense
- Managerial accounting
- General accounting
- Bookkeeping
- Internal control

Administration
- Legal
- Public relations
- Security
- Governmental reporting
- Office management

Planning, Control and Measurement
- Fiscal year business plan
- Annual operating plan
- Quarterly operating plan
- Reporting and control

Personnel Management
- Planning
- Acquiring
- Development and administration
- Reporting
- Termination

Operations Control
- Master production plan
- Transportation planning
- Performance reporting
- Inventory control

Capacity Management
- Determination of optimum capacity
- Capacity allocation
- Acquisition of capacity

Material Acquisition
- Vendor evaluation
- Order control
- Receiving and inspection

Plant Operations
- Planning, schedule and control
- Performance reporting
- Expediting
- Planning of material, manpower
- Order processing – plant order boards
- Product and process specifications
- Execution
- Order release
- Dispatching
- Storage/warehousing
- Quality
- Preventive maintenance
- Material transfer – to/from supplier/customer

Distribution

Buying
- Vendor selection
- Requirements
- When to buy
- Allocation
- Sales planning
- Inventory control
- Pricing
- Markdowns

Selling
- Presentation
- Display
- Manpower planning
- New item introduction
- Advertising
- Customer service

General Operations
- Purchasing
- Facilities maintenance
- Security
- Public relations
- Audit
- Inventory control
- Physical inventory control
- Internal communications
- Facilities development

Management and Financial Control
- Budgets
- Cash management
- Profit planning
- Measurement and control
- Capital expenditure planning
- Credit granting
- Financial negotiation
- New business

Administration
- Accounts payable
- Accounts receivable
- Payroll
- Statistical and financial reporting
- Audit
- Merchandise processing
- Personnel/training

Government

Judicial
- Prosecution
- Defense
- Court procedures
- Control
- Civil

Public Facilities
- Definition
- Construction
- Maintenance
- Property management

Public Protection Process
- Enforcement
- Confinement
- Rehabilitation
- Prevention
- Inspection

Finance
- Taxing
- Licensing
- Accounting
- Collections
- Funds management
- Payroll
- Purchasing

Personnel
- Recruiting/hiring/terminating
- Career development
- Job classification
- Labor relations
- Compensation and benefits
- Employee/position management

Management
- Conflict
- Measurement and control
- Policy determination
- Budgeting
- Security/privacy
- External relations
- Recordkeeping

Community Service
- Library
- Public records
- Election administration
- Cultural and recreational support
- Environmental control

Public Aid Process
- Eligibility determination
- Financial assistance
- Manpower
- Social services
- Residential care

Health Services
- Admissions
- Inpatient care
- Outpatient care
- Education and research
- Emergency care
- Community health services

Education - University

Student
- Promotion/recruiting
- Evaluation and admissions
- Class registration
- Academic and career advising
- Financial aid
- Student activities/life
- Student services
- Student status/archives

Credit Instruction
- Curriculum development
- Scheduling instructional resources
- Teaching and learning
- Evaluation and measurement

Research and Artistic Creativity
- Project identification and definition
- Procurement of resources
- Project execution
- Evaluation
- Dissemination of results

Public Services and Extension
- Activity development
- Administrative and logistical services for clientele
- Resource procurement and organization
- Activity delivery
- Activity evaluation

Financial Management
- Income acquisition
- Stewardship of funds
- Receipting and disbursement of funds
- Cash management
- Protection against financial liabilities
- Financial services
- Financial recordkeeping

Personnel
- Recruiting
- Hiring/termination
- Career development and evaluation
- Salary and benefit administration
- Employee relations
- Assignment of responsibilities
- Job classification
- Recordkeeping

Institutional Planning and Management
- Goals development
- Strategic planning (long-term)
- Tactical planning (short-term)
- Allocation of resources
- Monitor and control
- Internal communications

Physical Plant Management
- Program statement
- Design
- Construction and procurement
- Maintenance/operation
- Disposition
- Protection
- Rental property management

Goods and Services
- Assessment of needs
- Acquisition
- Inventory of expendables
- Inventory of non-expendables
- Distribution

Alumni Affairs
- Tracking
- Programs and services
- Institutional evaluation

External Communication and Relations
- Publicity
- Negotiation
- Public service
- Extra-university affiliation

Appendix D. Examples of Planning and Control Processes

Cyclical Planning and Control

Five-Year Business Planning
Establishment of a long-range business plan, taking into consideration such things as product, product demand, capacity, manpower, financial strategies, and information systems to achieve company goals.

Annual Operation Planning
Development of a medium-range operating directive to control the business activities in achieving the five-year business plan.

Quarterly Operation Planning
Quarterly restatement of annual operating plan, reflecting a 'firm' operating plan for three months and a 'forecasted' operating plan for the following three months.

Reporting and Control
Review of the performance of operating units to ensure the success of the plans. Change directions of operating units and/or plans when necessary to meet the objectives of the company.

Product Planning and Development

Technology Development
Includes applied research on new engines, combustion systems, material, etc., and basic research on new power systems.

Product Application
Application of research results to existing product line and new products.

New Product – Development, testing and release of new products (components, engines or "software").
Old Product – Application of improvements to existing products.
Application Engineering – Applying the basic engine to different customer applications (requirements).
Specifications – The process of developing and recording standard company specifications for products, material, inspection, process, supplier certification, etc.
Drafting and Records – Production of drawings that describe the product, its characteristics, and its applications.

Product Performance
Tracking and measuring the performance of an engine from the test cell through the field use; includes measuring warranty exposure and cost along with failure rates.

Capacity Planning

The determination of production and test capacity required to meet the planned production volume, allocation of this within the company and supplier facilities, and acquisition of any additional capacity.

Determination of Optimum Capacity
Required productive and test capacity is determined on the basis of the planned production volume.

Capacity Allocation
The assignment of productive and test capacity among the company and supplier plants. Make-*vs*-buy analyses are made to determine internal and external (supplier) requirements.

Market Planning and Strategies

Market Research, Market Development
Identify markets, lay plans, and set strategies for penetrating those markets.

Pricing
Establish as part of market penetration and product planning strategies.

Publications, Advertising, Promotion
Support and augment strategies and tactics of market development.

Sales Analysis and Forecasting
Provide necessary information to plan and measure strategies and tactics.

Warranty, Policy and Other "Software"
Establish as integral with strategies and tactics of market penetration.

Personnel Planning

Policies
The establishment and implementation of policies and practices concerning employment, development, compensation and evaluation of employees.

Requirements
Determination of manpower requirements in line with business objectives.

Financial Control

Establish, coordinate, and administer, as an integral part of management, an adequate plan for the control of operations.

Budget/Expense
Provide expense budgets and cost standards together with the necessary procedures to effectuate the plan.

Managerial Accounting
Compare the results of operations with plans and standards; interpret them for all management levels.

Operations Control

Development of a sourcing plan with and between the plants, the review of delivery performance, and corrective action necessary to accomplish the business commitments.

Master Production Planning
Translation of a central order board into a coordinated production plan and placing requirements in plants at a meaningful part level.

Transportation Planning
Determination of transportation strategies and capabilities necessary to support the operations plan.

Performance Reporting
The process of feeding back information on actual production against the master production plan on a periodic basis, and provision of input for any required modification of plans and schedules.

Inventory Control
Determination and control of the levels of inventory required to meet a predetermined level of production and service, with the objective of minimizing the overall cost.

Plant Operations

The process of producing products or parts according to a given schedule and specifications in the most efficient manner.

Planning, Scheduling and Control
Determination of quantities to be produced on a daily basis and the corrective action taken if necessary.

Performance Reporting – Communicating the quantities produced in a given time.
Expediting – Short-term replanning as required.
Planning of material, manpower, and optimum use of equipment
Order Processing – The process of maintaining a plant order board of all products to be shipped, including finished engines, components, kits and service parts, both to customers and other plants.
Product and Process Specification – Maintenance of records regarding product definition and the incorporation of engineering changes.

Appendix E. Sample Descriptions of Processes

Market Process

The activities necessary to identify and satisfy the wants and needs of chosen customers at a profit.

Marketing Planning
Setting marketing objectives and strategies to support overall company objectives.

Inventory Levels – Determining raw material and finished goods inventory levels to meet profit objectives and supply the customers' needs.

Marketing Research
Systematic, objective, detailed search for and study of facts and information relevant to any marketing problem or opportunity.

Consumer Research – Measurement and interpretation of consumer attitudes.

Product Research – Securing facts relating to desired product characteristics; the measurement and evaluation of product sales potential.

Sales Research – Measurement and evaluation of the company's sales potential by geographic area.

Merchandising
A creative activity having as its purpose the development of the products necessary to meet predetermined profit, volume and "niche" objectives.

Product Development – Styling, i.e., the mating of distinctive aspects of a product to appropriate materials and trim from selected sources; determining the proper fold, package and labeling of the finished product.

Pricing – Matching manufacturer's cost to customer requirements. Includes preliminary costing.

Price Lining – Building the proper depth at each price point.

Forecasting – Sales forecasting and reforecasting.

Quality level – The intrinsic value level of product agreed upon between buyer and seller.

Advertising and Promotion
The activity that communicates the need-satisfying benefit of the product to potential consumers.

Sales Promotion – Those methods used to create customer traffic at the retail level.

Sales
Matching customer needs to products.

Selling – Coordinates with Advertising and Promotion, Distribution, Inventory Levels, and Production Planning.

Customer Service
Activities of service and support to communicate to the buyer and to the stores the status of all products at all times. This includes the traditional concept of order entry and order allocation. This is a service to buyers which provides actionable trade information.

Customer Service/Retailing
Use of credit cards, refunds made at retail stores, customer complaints.

Distribution Process

Activities required to move finished products to customers on time.

Receiving
The act of identifying, counting, verifying, and inspecting finished products.

Inspection – The determination and classification of the quality of finished goods.

Returns – The handling of finished products returned from a customer, the determination of action necessary, and the return of goods to inventories.

Storing
The safeguarding, recounting and internal handling of finished products to ensure accountability for location and cycle inventory checks.

Packing and Repacking – An activity that results in a recombination of units or styles into a shipping/order unit.

Marking – The affixing of identifying information and/or price to an individual unit of finished product.

Inventorying – The counting of units of individual products for comparison to recorded quantities.

Liquidating – Sale of obsolete finished goods.

Shipping
The activity of moving stock to a customer on time.

Documentation – The recording and recordkeeping relative to the picking, packing, and shipping of customer orders.

Traffic – The determination of routing and carriers for customer shipment.

Vehicles – The scheduling and maintenance of company-owned or leased trucks.

Unique Retailing Operations
The activities related to the distribution of supplemental finished products to a customer.

Stock Replenishment – The acquisition and distribution of finished products in relation to units of stock sold.
Point of Sale – The collection and analysis of statistics concerning actual unit sales.

Personnel Process

Development and administration of policies and programs to attract, develop and hold qualified employees and ensure their equitable treatment and advancement to their highest level of competence.

Manpower Planning and Development

Planning, selecting, educating, and training the manpower required to accomplish the company's objectives.

Affirmative Action – Development and administration of policies, procedures and programs that result in hiring, rewarding, and promoting qualified minorities.
Manpower Planning – Determination of the quantitative and qualitative manpower requirements of the organization and the development and administration of programs to acquire and/or develop the manpower needed.
Recruitment and Selection – Searching out, evaluating and selecting employees to meet the specified requirements and accomplish company objectives.
Education and Training – Aiding in the determination of the education and training needs of employees and arranging for the development and conduct of such education and training.
Manpower Development – Aiding in the determination of the personal development needs of individual employees, and in the planning of ways and means to provide that development in order that each employee is aided in achieving his highest level of competence.

Employee Compensation and Benefits

Development and administration of policies, procedures and programs designed to attract and hold employees and to reward them equitably according to the quality of their work, by means of salaries, wages, benefits, etc.

Employee Attitudes/Relations

Development and administration of policies, procedures and programs to develop and maintain a high state of employee morale and productivity, and to monitor that activity and recommend action as necessary to accomplish objectives.

Employee Morale – Development and administration of programs to monitor employee morale and to recommend action to maintain a motivated, productive, satisfied work force; to commit to employees only what has been approved and then to follow up on any commitments made.
Communications – Developing and administering policies, procedures and programs to keep employees well informed on things they need to know to perform their work, and to promote positive attitudes and job satisfaction.
Separation/Retirement – Development and administration of policies, procedures and programs pertaining to the separation and retirement of employees.

Employee Safety and Health

Establishing and administering policies and programs to protect the safety and health of all employees.

Financial Process

The activities involved in the acquisition and management of the fiscal resources of the company.

Financial Planning

The process of setting financial objectives and strategies to support overall company objectives.

Cash Requirements Forecasting – Determining total cash needs by period, on the basis of annual plans, and weekly accounting unit needs.
Capital Requirements Forecasting – Reviewing long-term needs for capital and leased equipment, on the basis of annual plans.
Profitability Analysis Forecasting – Predicting profitability trends by units, on the basis of annual plans and historical information.

Funds Acquisition and Management

The process of securing the funds necessary to run the company.

Capital Structure – Determining the source of funds such as retained earnings, sale of stock, short-term borrowing, long-term debt, lease obligations.
Banking Relationships – Developing avenues of short-term capital to satisfy cyclical requirements; establishing deposit banks to speed up cash collection.
Investment Community Relationships – Supplying information to financial analysts to develop sources of long-term borrowing, improving performance of stock, and meeting SEC requirements.

Financial Operations

The process of controlling the assets of the company.

Tax Accounting – Filing appropriate tax returns, optimizing savings whenever possible.
Government Reporting – Filing appropriate forms for use of agencies as required by law.

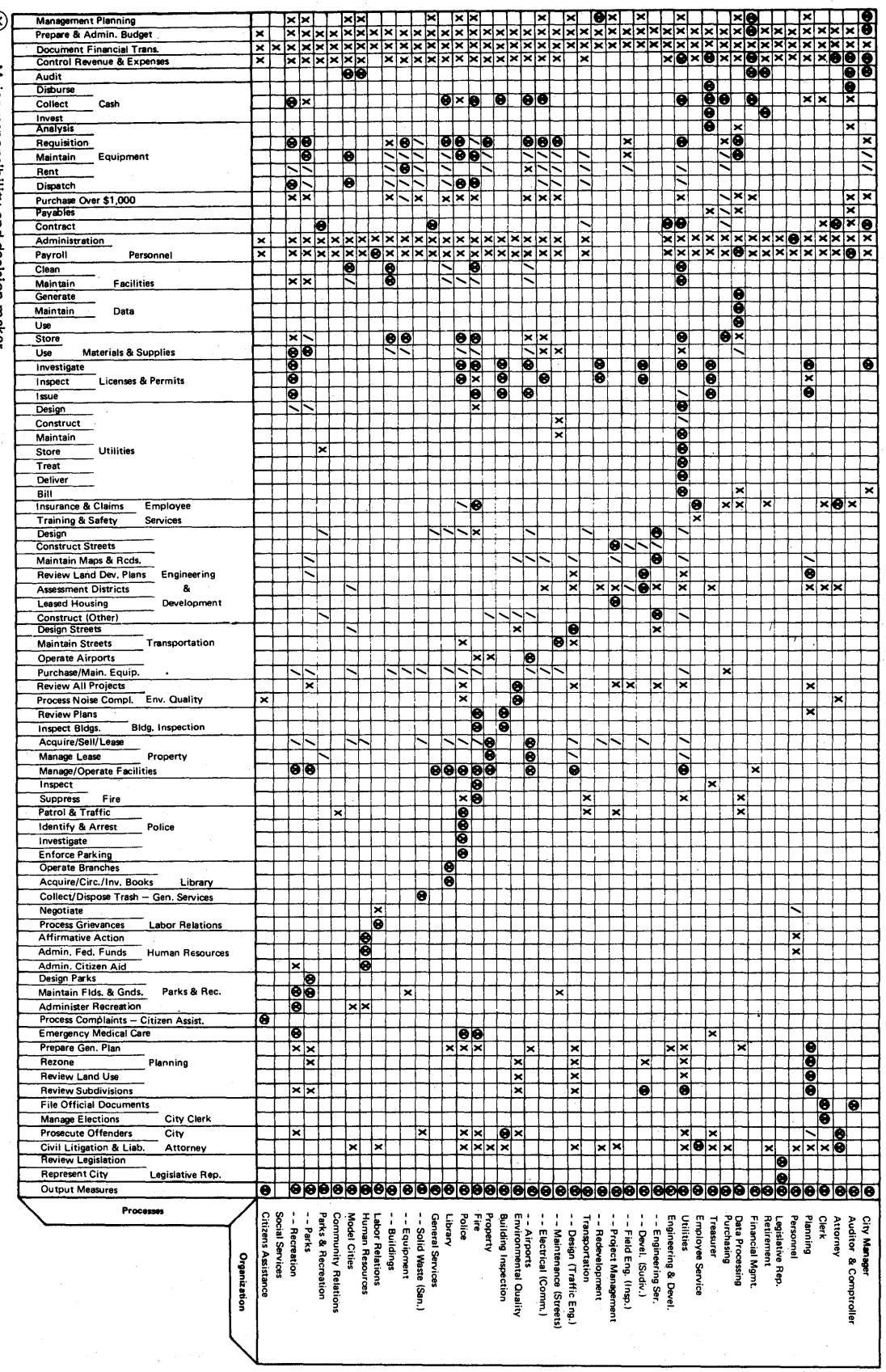
Budgets – Preparing period plans with the assistance of marketing and production.
Cash Management – Controlling borrowing and cash flow within established guidelines.

Financial Reporting and Analysis
Compiling and analyzing financial data, determining trends, and recommending actions to be taken.

Risk Management
Determining areas of risk and obtaining coverage where needed.

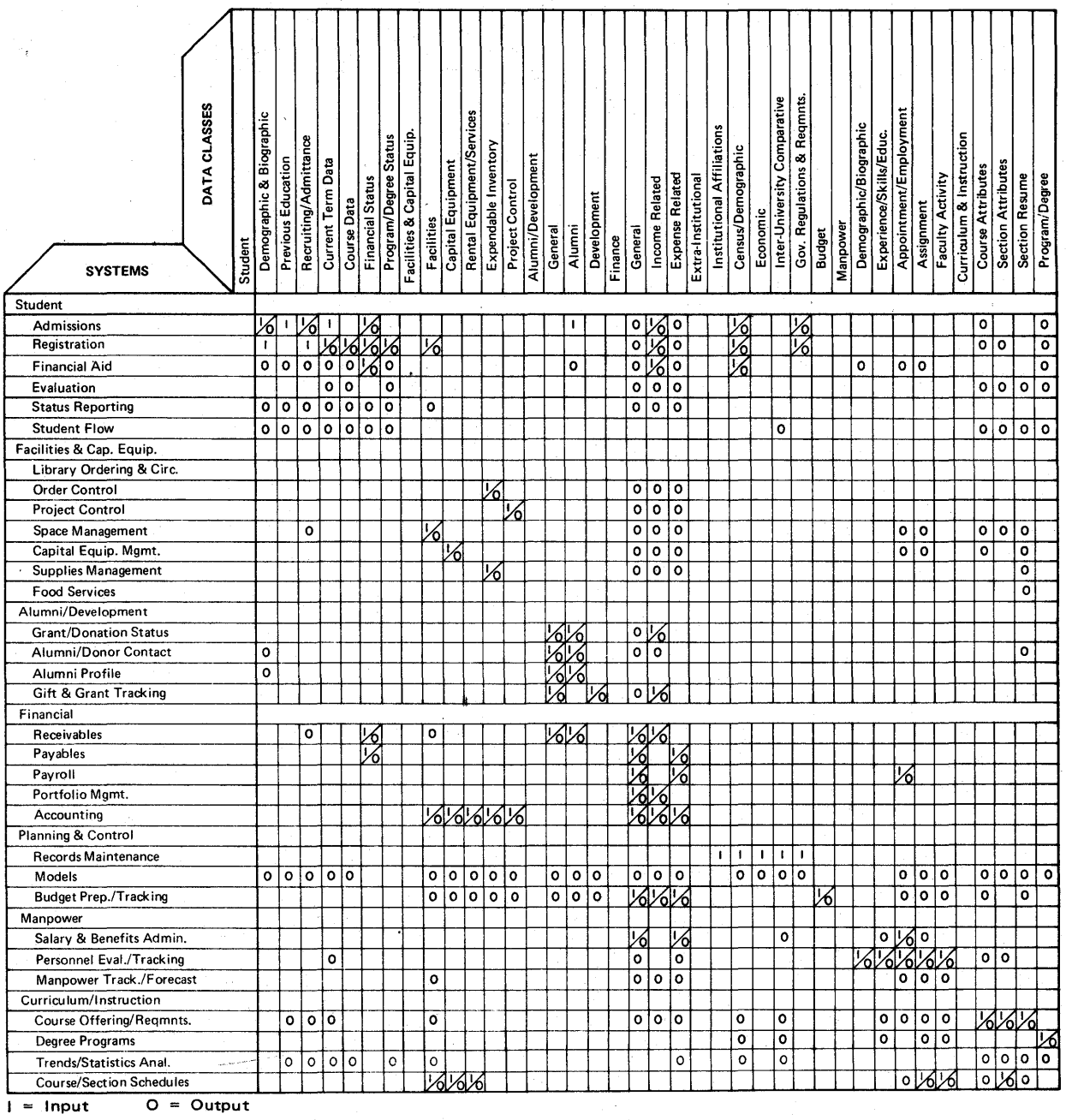
General Accounting
The process of doing the day-by-day accounting work of the company.
General Ledger – Maintaining records of original entry for all financial transactions of the company.
Accounts Payable – Recording, verifying and satisfying obligations of the company.
Fixed Asset Accounting – Maintaining records for security, production and tax needs.
Payroll – Maintaining records and paying employees of the company according to established procedures.
Credit and Billing – Authorizing credit, billing at established prices, recording payments, and effecting collections.
Inventory Valuation – Physical counting of assets of the company, determining values, and recording differences.
Overhead Allocation – Spreading fixed or common expenses by various methods appropriate to the particular item or location.
Cost Accounting – Maintaining standard cost records of all products, recognizing variances, and recording them within established procedures.

Appendix F. Examples of Business/Systems Relationship Matrices



Vehicle Disposal					Vehicle Rent & Lease					Vehicle Acquisition					Marketing							Finance						Management						Processes / Systems
Tax & Transfer	Collection	Market Analysis	Where to Sell	When to Sell	Contract Termination	Maintenance	Issue Contract	Credit Check	Reservation	Acceptance & Registration	Purchase Order Issuance	Quantity	When to Buy	Equipment Specifications	Competitive Analysis	Account Service	Account Selling	Advertising/Promotion	Franchise Sales/Service	Develop Mkt'g Strategy/Force	Marketing Research	Acquisition of Funds	General Accounting	Accts Receivable	Payroll	Accounts Payable	Asset Tracking	Asset Util. & Control	Personnel Devel. & Util.	Monitor & Control	Budgeting	Short Range Planning	Long Range Planning	Systems
																							C			C				C				Accounts Payable
																C	C													C				Annual Volume Rebate
			C	C	C	C	C	C	C																					C				Air Care
								C																										Credit Cards
																														C	C			Centrex Phones
																														C				Data Entry Stats
																														C				Deposits
																														C				Documentation Library
																							C							P				Daily Reporting
									C/P																		C	C		C				Floating Fleet
																																		General File Support
			C	C								P	P									P	C				C	C	C	C	C	P		General Ledger — Car Leasing
			P	P								C	C									C	C				C	C	C	C	C	P		General Ledger
					P																									C				Input Processing (Car R/A's)
					P																									C				Truck Entry (Truck R/A's)
							C																							C				Leasing Commission
																											C			C				Licensee Lease
																											C			C				Licensee Receivables
		P																												C				Market Penetration
									C																									Reservations
								C																										National Discount Bulletin
																											P	C		C				Pool Control
	C							P								C	C					C		C			C	C		P	P			Open Receivables
	C							P								C	C					C		C			C	C		P				Car Leasing — Receivables
																									C				C	C				Payroll
																														C				R/A Control
																														C				Rental Properties
																			C											C				System Fees
																														C				Systems and Programming
																							C											Tabs
																							C											Taxes
C	C		C	P	P	C	C	C	C	C	C	C	C	C		C	C			C		C	C				C	C		C				Car Lease — Vehicles
C			C	C								C	C	C								C	C				C	C		P				Vehicle Master — Corporate
			C	C						C	C	C	C									C	C					C		C				Vehicle Purchase Order

C = Current P = Planned



I = Input O = Output

Appendix G. Sample List of Wall Charts for Control Room

- Objectives of the Study
- Scope of the Study
- Organization Chart – Business and Data Processing
- List of Interviewees – Time and Day Schedule
- Names of the Study Team Members
- Business Goals and Objectives
- Data Processing Budget Information
- Current Systems/Organization Matrix
- Current Systems/Master Data File Matrix
- Products/Markets Data
- Map of the Distribution System
- Definitions of BSP Terminology
- Study Work Plan (Chart or Study Calendar)
- Study Report Outline
- Business Environment – External and Internal
- Process/Organization Matrix

Appendix H. Risk - Potential Benefit Analysis

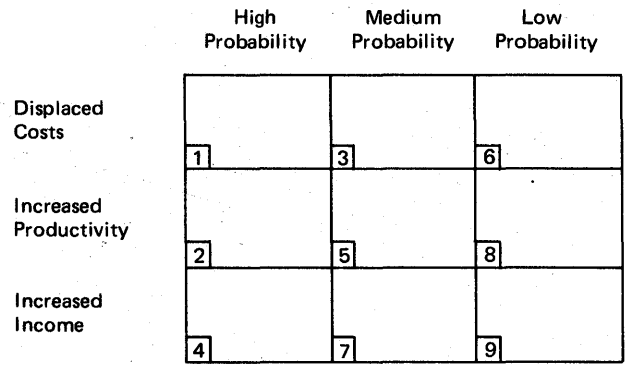
This technique attempts to quantify each perceived potential benefit. The textbook solution is to have the executive make a "ballpark" estimate of potential savings or gains. However, it is often difficult, though not impossible, to assign dollar savings to such areas as faster response time, tighter management control, and improved product performance.

Assess potential values conservatively. Remember that estimates are useless unless the executive believes they are possible and really apply to his situation. When asking questions that will help the executive to make estimates:

- Use a *conservative* guess, with a range of potential return of savings.
- When at all doubtful, use figures the *executive* sees as absolute minimums.
- When you refer to similar situations, be sure that they really are similar and that the executive can verify them.
- Look for previous or currently existing data and statistics that indicate the range of potential return or savings.

The team should focus on broad benefits to the point that they can be operationally defined.

Probability prediction is a valuable tool, because it lends credibility to the estimates upon which justification is based. Use of the benefits matrix arrangement shown here may be particularly valuable in helping to assign approximate dollar values to benefits.



The potential benefits matrix is used in the following manner:

1. The potential benefits from each subsystem are totaled by the following categories:
   a. Displaced costs (increasing speed, reducing redundancy, etc.). Data processing has traditionally been evaluated in terms of cost displacement. This condition exists when a task, machine, supplies, or other expenses should no longer be required as a result of the new system. An example might be displacement of keypunch operators through remote data entry.
   b. Increased productivity (reducing widely varying workload, applying information to all areas of business, etc.). Another benefit accrues because the new system should allow existing or future facilities or people to do more work. This category may be viewed, therefore, as one of increased productivity and accuracy on the part of a clerical staff through online data entry. Future personnel requirements can potentially be held to a minimum.
   c. Increased income or revenue (automatic decision making, more data to aid decision, exception, reporting, etc.). This final category addresses the use of advanced computer applications to increase income. For example, freedom from routine decision making may enable management to spend more time on the really important decisions. Attainment of this benefit depends on business policy and the ability to effectively use the computer resource.

In the example of production planning, the benefits estimated during the interviews with the vice president of production, the director of production planning and the manager of electronic sales might be:

$1,000,000 – materials reduction
300,000 – labor reductions
600,000 – increased production
500,000 – sales increase

2. Using the estimated maximum potential savings, the team then estimates a dollar amount of that total possible return for which there is:
   a. High probability of realization
   b. Medium probability of realization
   c. Low probability of realization

For instance, as shown in the following illustration, an automated production planning system might result in a toal materials saving of $1,000,000 annually but that total may not be immediate or certain. However, it is estimated that:

   a. There is a high probability that raw materials may be reduced by $500,000.
   b. There is a moderate probability of an additional saving of $200,000 in finished goods inventory.
   c. While it isn't certain that the entire $1,000,000 could be saved, it is possible. In this case, a further saving would result for an additional $300,000.

	High Probability	Medium Probability	Low Probability	
Displaced Costs	500,000 100,000 1	200,000 100,000 3	300,000 100,000 6	Materials reduction Labor reduction
Increased Productivity	300,000 2	200,000 5	100,000 8	Increased production
Increased Income	200,000 4	200,000 7	100,000 9	Profit increase
Total	1,100,000	700,000	600,000	

3. This procedure is repeated for each I/S potential benefit for which there is high potential saving. Depending upon time available, estimates should be developed for all areas that could be quantified during the interviews. Totals are then developed in each category and for each subsystem.

SUBSYSTEM	RISK LEVEL 1	2	3	4	5	6	7	8	9	TOTAL
Production Planning	600	300	300	200	200	400	200	100	100	2,400
Production Scheduling										
Plant Status										
Order Entry										
Order Status										
Sales Control										
Cost										
Bills of Material										
Product Data Control										
Purchasing										
Raw Materials Inventory										
Finished Goods Inventory										
Sales Analysis										
Forecasting										
Financial Modeling										
Territory Analysis										
Engineering Design										
Skills Inventory										
Compensation Administration										
Financial Planning										

Notice that a number has been assigned to each cell of the matrix for illustration purposes only. These numbers show the likelihood that the potential benefit will happen. After the data has been collected, the team lists the dollar estimates for each system on the potential benefit level – risk level table shown. Each system is listed down the side of the table and the dollar amounts from each cell are entered in the correspondingly numbered column.

The rows are then totaled. The completed table is a useful tool for summarizing in dollar terms the potential benefits of the system the team recommends. The systems areas may now be compared (and/or ranked) on the basis of total (right-hand column) or any combination of risk levels (from left to right).

Note: When recommending the first system for implementation, the study team should be alert to a potential problem. The most needed system may prove to be impractical to implement until another system is installed to furnish necessary input data. In such a case, management should be informed so that the reason for recommending a lower-priority system is understood.

Appendix I. ISM Processes

Planning and Control

Strategic Planning

Assumptions Management
- Environmental analysis
- Tracking business objectives
- Human resource projections and skill requirements
- Technology direction

Determining Policies

Setting I/S Objectives

Defining & Maintaining Information Architecture
- Business direction
- Information requirements

Resource projections (installations, headcount and expense levels)

Management Control

Project and Resource Planning
- Long-range planning
- Capacity planning
- Justification and funding
- Short-range planning (projects, resources, organization, technologies, and skills)
- Budgeting

Software, and Communication Facilities
- Monitor technological development
- Financial analysis
- Benchmark/testing

Utilization Control
- Data usage
- Equipment usage
- Communication facilities usage
- Functional modules usage

Performance Measurement
- Budget performance
- Project phase reviews
- Quarterly project status reporting
- User satisfaction
- Application installation follow-up
- Security and recovery analysis
- Change status review
- Operations analysis
- Capacity status review
- Vendor performance
- Adherence to management practices

Auditing
- Operations
- Project
- Management

Data Administration

Planning and Control
- Data planning
- Data acquisition
- Dictionary/directory management
- Standards management
- Documentation and training
- Plan measurement

Performance Control
- Physical design
- Modeling
- Performance evaluation
- Tuning
- Reorganization

Usage Control
- Logical design
- Security, availability, auditability, and integrity management
- Usage measurement
- Recovery
- Query

Organization and Administration

Manage the Organization Structure

Define management practices (funding, project initiation, project control, auditing, justification, methods and standards, planning and budgeting, personnel, key measurements, data, and security)

Manage Personnel
- Recruiting and hiring
- Career development
- Evaluation and productivity improvement

Accounting
- Project accounting
- Chargeouts
- Recordkeeping

Purchasing

Used Equipment Sales

Information Systems Development

Requirements Definition
- Define subprocesses
- Define information requirements
- Determine objectives and control points
- Analyze cost/benefits
- Prepare design/development plan

External Design
- External functions
- User inputs, output, data requirements

Depict systems flow and controls
Data security
Build test cases

Internal Design
Design internal modules
Develop test plan
Design walkthroughs
Model systems performance

Program Development
Develop program specifications
Code and test
Integrate

Systems Test
Perform systems test
Test user documentation
Test documentation for operations and maintenance
Test installation and conversion plan
Test security

Installation and Maintenance
Train users
Train operators
Convert data
Cutover
Monitor reliability
Post-installation audit
Requirements analysis
Change management

Functional Modules
Specify requirements
Develop standards
Make-or-buy decision
Develop/purchase
Install
Dictionary/directory and library maintenance
Audit

Systems Management

Capacity Management
Define current system and load
Forecast future workload
Evaluate configurations/designs
Track and analyze development

Change Management
Propose and document changes
Plan/coordinate changes
Implement changes
Report, track and analyze changes

Problem Management
Report problems
Monitor problems
Resolve problems
Analyze and prevent problems

Operations Management
Monitor/modify network, workload and configuration
Schedule workload
Operate/process
Interface to users (problems and job requests)

Recovery Management
Determine recovery requirements
Define recovery process
Test and update recovery process

Performance Management
Set objectives
Measure and analyze performance
Modify/tune performance

Security/Audit Management
Assess current audit and security status
Set requirements for authorizations, documentation and reconciliations
Identify owners, users, and custodians of data
Control I/O, error handling, and retention
Provide physical security
Monitor for compliance

Executive Reporting
Identify summary data
Collect and analyze summary data
Distribute reports/modification information

Appendix J. Potential Topics for BSP Study Report

Executive Summary Report

Purpose, scope and objectives
Methodology and study team
Summary of conclusions and recommendations
Action plan for follow-on activities

Detail Report

Purpose, Scope and Objectives
- Reasons for conducting study
- Level of organization selected
- Objectives of the study team

Method of Study
- BSP concepts
- Overview of study approach
- Study team members

Business Perspective
- External environment
  - Economic, government, competition
  - Technology, customers, suppliers
- Internal environment
  - Policies, practices, constraints
- Business planning
  - Goals, objectives, strategies
  - Planning approach and horizons
  - Measurements and controls
- Organization
  - Relationships (chart)
  - Numbers of people
  - Geographic distribution (map)
- Products/services
  - Description, volume
  - Markets, trends
  - Industry position and industry trends
- Financial
  - Statistics
  - Revenue-profit trends (chart)
- Business processes
  - Definition(s)

Information Systems Pespective
- External environment
  - Technology, customers (users), vendors
- Internal environment
  - Policies, practices, constraints
- I/S planning
  - Goals, objectives, strategies
  - Resources, project schedules
  - Planning approach and horizons
- Organization
  - Relationships (chart)
  - Numbers of people
  - Geographic distribution (map of equipment, terminals, etc.)
- Information Systems Profile
  - Hardware and software (chart)
  - Operational and planned systems
  - Data files
  - Major users
- Financial
  - Budgets
  - Justification and funding processes

Findings and Conclusions
- Definition of data classes
  - Relationship of data class to current data files (matrix)
  - Relationship of data class to business entity (matrix)
  - Relationship of data class to business processes (matrix)
- Analysis of business/systems relationships
  - Process relationships (diagram)
  - Process/organization relationship (matrix)
  - Application support/organization (matrix)
  - Application support of processes (matrix)
  - Relationship of applications to data class (matrix)
- Executive interview results
  - Summary of major problems, solutions, and Information System needs (chart)
- Information Systems Management requirements
  - Method used to determine ISM solutions and priorities
  - Description of projects that address major ISM problems

Recommendations
- Information Systems Management
  - Data management, I/S planning functions (additions/changes)
  - Control and measurement procedures
  - Requirements for a detailed Information Systems plan
- First system or subsystems
  - Requirements for definition
- Information architecture
  - Must be further defined – in particular, the data bases

Action Plan for Follow-On Projects
(For the above recommendations)
- Description(s)
- Deliverables
- Schedules
- Resource requirements
- Project control methods

Appendices

Glossary of terms
Key correspondence
Interviewee list and questions
Narrative descriptions – processes
Narrative descriptions – current applications/ systems
Supporting statistics

Glossary

Action plan – The group of activities, schedules, and resources recommended as a result of a BSP study (may be referred to as a general information systems plan).
Application – A data processing activity providing information to one or more organizational units.
Architectural priorities – The recommended sequence for implementation of the information architecture.
Business – The organizational entity being studied, regardless of its size or purpose, either private or public sector.
Business process – A group of logically related decisions and activities required to manage the resources of the business.
Business Systems Planning – A structured approach to assist a business in establishing an information systems plan to satisfy its near- and long-term information needs.
Control room – A work and interview room set aside for the continuous use of the team throughout the BSP study.
Data class – A category of logically related information. Examples are customer, vendor, customer orders, parts inventory, and appropriations.
Data base – A non-redundant collection of interrelated data items processable by one or more applications.
Data file – An individual group of data related to or used by an existing application before implementation of a data base approach.
External environment – Influences that exist outside the business being studied and over which the business has little or no control, e.g., government regulations, industry, competition, economy.
Follow-on projects – Activities that occur after and as a result of the BSP study.
Goal – A broad, general direction or intent.
Information architecture – The structure of information systems and data that will provide information to support the business.
Information system (I/S) – A logical group of subsystems and data required to support the information needs of one or more processes.
Information systems management – Those functions required to manage the information systems resources for the most efficient and effective support of the business.
Information systems plan – A plan that gives specific goals, strategies, project descriptions, resources, and schedules for the design, development, and implementation of an information architecture.
Objective – A specific and measurable item or element of a goal.
Resource – That which is used or consumed by the business in the fulfillment of its objectives.
Scope – The defined boundaries of the business being studied – divisions, function and geographic locations included and excluded.
Sponsor – The executive who gives approval for the BSP study and to whom the team is responsible.
Strategy – A planned action for achieving an objective.
Team leader – The person who directs the study team, participates full time, and is responsible for the success of the study.
Work plan – A plan that is developed to show activities, responsibilities and schedules for the work to be performed during the BSP study.

Business Systems Planning – Information Systems Planning Guide
Application Manual
GE20-0527-2

READER'S COMMENT FORM

This form may be used to communicate your views about this publication. They will be sent to the author's department for whatever review and action, if any, is deemed appropriate. Comments may be written in your own language; use of English is not required.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply.

Note: *Copies of IBM publications are not stocked at the location to which this form is addressed. Please direct any requests for copies of publications, or for assistance in using your IBM system, to your IBM representative or to the IBM branch office serving your locality.*

Possible topics for comment are:

Clarity Accuracy Completeness Organization Coding Retrieval Legibility

If you wish a reply, give your name and mailing address:

_____

_____

_____

Note: Staples can cause problems with automated mail sorting equipment. Please use pressure sensitive or other gummed tape to seal this form.

What is your occupation? _____

Number of latest Newsletter associated with this publication: _____

Thank you for your cooperation. No postage stamp necessary if mailed in the U.S.A. (Elsewhere, an IBM office or representative will be happy to forward your comments or you may mail directly to the address in the Edition Notice on the back of the title page.)

GE20-0527-2

Reader's Comment Form

Fold and tape | Please Do Not Staple | Fold and tape

First Class
Permit 40
Armonk
New York

Business Reply Mail

No postage stamp necessary if mailed in the U.S.A.

Postage will be paid by:

International Business Machines Corporation
Department 824
1133 Westchester Avenue
White Plains, New York 10604

Fold and tape | Please Do Not Staple | Fold and tape

International Business Machines Corporation
Data Processing Division
1133 Westchester Avenue, White Plains, N.Y. 10604

IBM World Trade Americas/Far East Corporation
Town of Mount Pleasant, Route 9, North Tarrytown, N.Y., U.S.A. 10591

IBM World Trade Europe/Middle East/Africa Corporation
360 Hamilton Avenue, White Plains, N.Y., U.S.A. 10601

Cut or Fold Along Line

Application Manual Business Systems Planning – Information Systems Planning Guide Printed in U.S.A. GE20-0527-2

GE20-0527-2

Application Manual Business Systems Planning – Information Systems Planning Guide Printed in U.S.A. GE20-0527-2

International Business Machines Corporation
Data Processing Division
1133 Westchester Avenue, White Plains, N.Y. 10604

IBM World Trade Americas/Far East Corporation
Town of Mount Pleasant, Route 9, North Tarrytown, N.Y., U.S.A. 10591

IBM World Trade Europe/Middle East/Africa Corporation
360 Hamilton Avenue, White Plains, N.Y., U.S.A. 10601