

Canada

USER'S
GUIDE

INFORMATION SYSTEMS MANAGEMENT



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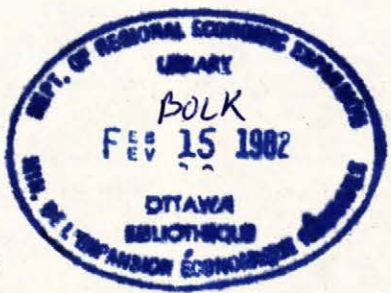
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DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

SYSTEMS DEVELOPMENT LIFE CYCLE METHODOLOGY

USER'S GUIDE



OCTOBER, 1981

I N D E X

1. PROJECT MANAGEMENT HANDBOOK
2. DELIVERABLES REFERENCE MANUAL
3. USER'S GUIDE
4. ANALYSIS GUIDE
5. DESIGN GUIDE
6. PROGRAMMING GUIDE

NOTE: It is recognized that all roles referred to throughout this document will be filled by persons of either sex. However, to maintain readability, personel pronouns of the male gender are used.

He should be read as he/she.

His should be read as his/hers.

Him should be read as him/her.

SYSTEMS DEVELOPMENT LIFE CYCLE METHODOLOGY

USER'S GUIDE

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SECTION 1

INTRODUCTION

- 1.1 Purpose
- 1.2 Objectives
- 1.3 Scope
- 1.4 Introduction to ISM

1. INTRODUCTION

1.1 Purpose

This guide has been prepared for the purpose of explaining to users of information systems:

- . the development life cycle of an information systems project;
- . the user's role and responsibilities during the life cycle;
- . roles played by others in the life cycle;
- . some of the development terminology.

1.2 Objectives

- . To obtain active end-user participation in information system development projects.
- . To get the user community to collectively take responsibility for defining the business content of information systems.
- . To get the user community to exercise quality control over the business content of information systems.
- . To involve user management in the information systems planning and approval process during all phases of the development life cycle.

1.3 Scope

While this methodology is equally applicable to any information system whether it be a business or a technical system and automated or manual, its orientation beginning with the Systems Design phase, is unavoidably towards computer applications. In view of this, it is important that when system solutions are conceived both the status quo and manual systems be considered on an equal basis with automated systems.

Ideally this methodology should be used in the context of an overall departmental systems planning process. Thus, this methodology has been developed with the assumption that a proposed systems development project should be evaluated in relation to the Department's Long Range Systems plan which will make it possible to prioritize systems development projects. It is also assumed that for significant projects, regular status information will be fed into the monitoring process of the Department's systems plan.

1.4 Introduction to ISM

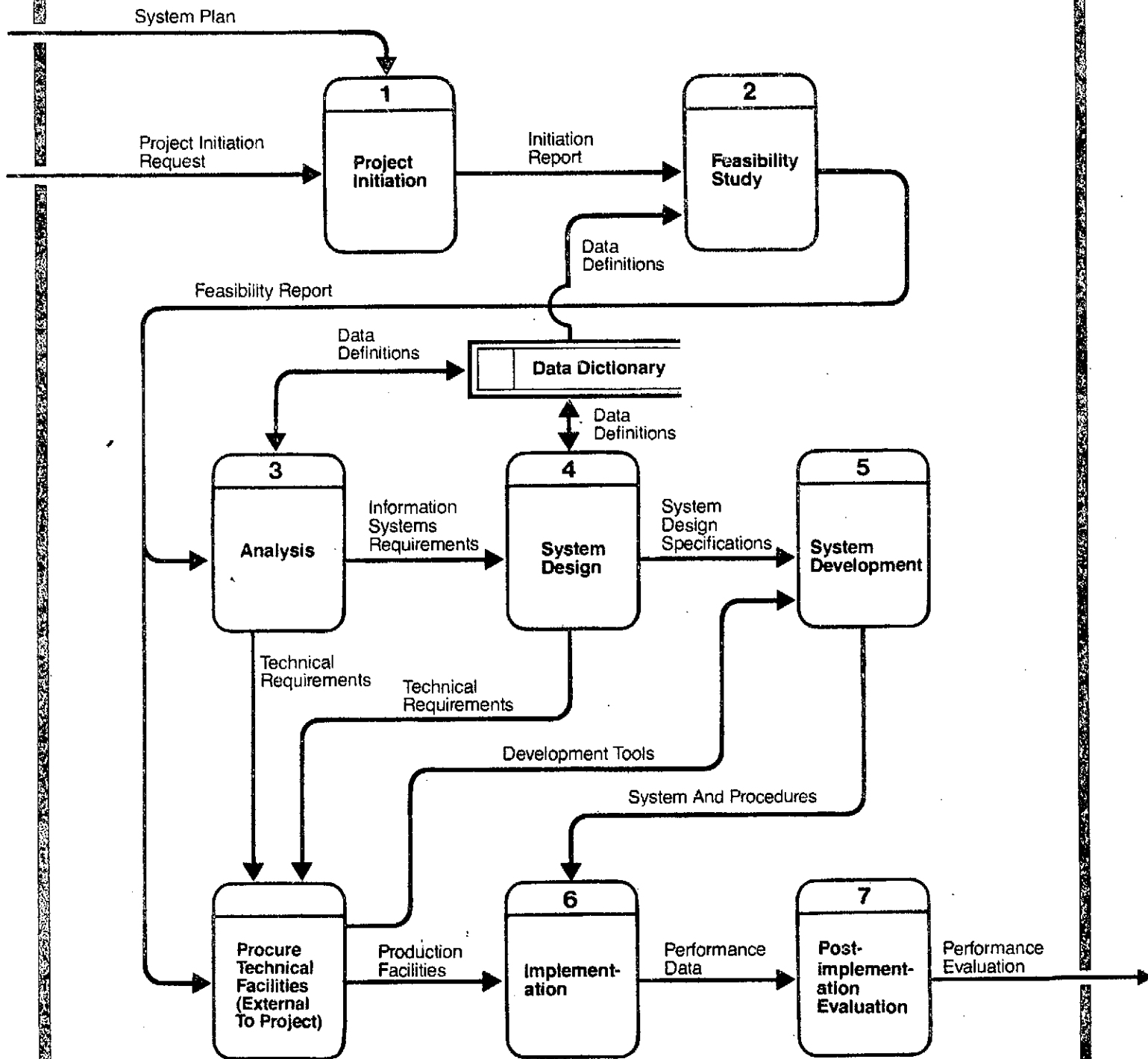
To be written by ISM management.

SECTION 2

SUMMARY OF SYSTEM DEVELOPMENT
LIFE CYCLE

- 2.1 Overview Data Flow Diagram
- 2.2 Phase Summaries

Systems Development Life Cycle



2.2 Phase Summaries

The preceding diagram illustrates the phases comprising the System Development Life Cycle of most information system projects. It depicts how the cycle commences with the receipt of a Project Initiation Request and ends with the preparation of a Post-Implementation Evaluation Report following system implementation. The end of each phase represents a major checkpoint where management, external to the project, may review the continuing viability of the project and, as appropriate, commit only the resources needed to complete the next phase.

Summaries of each phase are as follows:

. Project Initiation

Every project begins with the identification of an opportunity to be exploited, a problem to be solved, or a requirement to be satisfied. This phase starts when a request is received (for example, on a Project Initiation Request form) from a user. The request is first screened to ensure that it is properly authorized, that the source of development funds is identified and that there is justification for proceeding further. Following this, details of the request are documented by a (Business) Systems Analyst. The analyst prepares a brief Initiation Report which documents the issues to be addressed, objectives, scope, benefits, timeframe, policies, constraints and potential solution strategies.

The objective of the report is to outline for management the initial perception of the issue, and to recommend an action plan to study the feasibility of various solutions.

Normally, preparation of the report takes about one half of a day.

. Feasibility Study

This phases involves the Analyst or team of analysts, working together with user management in the research and analysis of subject related data in order to identify various solutions. The solutions are both manual and automated, and are evaluated for their relevance and costs/benefits.

The overall objectives are to define the users requirements to the extent necessary to select a solution (or path), to develop a conceptual system design and to secure further resources in order to perform a detailed analysis of the information systems requirements.

The Feasibility Study is carried out at a general, or conceptual, level. It provides management with an early opportunity to evaluate the project's viability before any substantial amounts of money have been expended and also to re-evaluate it in relationship to the user's priorities and strategies.

. Analysis

The Feasibility Study examined the issue being addressed by the system at a general level. The Analysis phase examines it at a very detailed level in order to define the precise business processes and the set of information forming the business system.

This definition establishes the basis for outlining the system from a user perspective. For EDP systems, this means that at the end of this phase the user will know what information is included in the system and what business processes will be computer assisted.

The Analysis phase involves substantial end-user participation. It is during this phase that the business content of the system is documented in preparation for the design and development phases.

. System Design

Whereas the Analysis phase defined the "what" of the system, the System Design phase defines "how".

The specifications delivered by the previous phase represent the bridge between the user community, which collectively defines the business requirements for the project, and the project designers, who design a system to address these requirements.

User participation in this phase involves reviewing and approving more detailed aspects of the system such as report and screen layouts, office procedures, or input forms.

- System Development

The objective of this phase is to develop the working procedures and, if automated, the computer programs according to the system design specification as defined in the previous phase. Testing of the procedures and programs is also done to ensure that all components of the system work properly.

- Implementation

In this phase the working procedures and programs developed are made operational. Users are trained in preparation for the "live" running of the new system, data files are converted from old media to new media and the new system is installed. Parallel running, when applicable, takes place.

- Post-Implementation Evaluation

This phase studies the performance of the system for a pre-determined period after the system has been in operation and presents to management conclusions and recommendations. Optionally, according to management's preferences, it may also study the effectiveness and efficiency of the development process itself.

SECTION 3

ROLES IN SYSTEM DEVELOPMENT LIFE CYCLE
LIFE CYCLE

- 3.1 Major Responsibilities by Phase
(Matrix)
- 3.2 Summary of Roles

3.1 MAJOR RESPONSIBILITIES BY PHASE

PHASE	DELIVERABLE/TASK	APPROVAL AUTHORITY	MANAGEMENT AUDIT	USER		PROJECT TEAM			
				MANAGEMENT	STAFF	PROJECT MANAGER	SYSTEMS ANALYST	SYSTEMS DESIGNER	PROGRAMMER
1. Initiation	Initiation Report	Approve	Approve	Approve	Participate	Prepare			
2. Feasibility Study	Feasibility Report -User Requirements -Conceptual Solution	Approve	Approve	Approve	Participate	Review	Prepare		
3. Analysis	Requirements Approval Authority Submission	Approve	Review	Approve Approve	Participate	Review Prepare	Prepare	Participate	
4. System Design	EDP Design Specification Design of User Aids Approval Authority Submission	Approve	Review	Approve Approve	Participate Participate	Approve Review Prepare	Review Prepare	Prepare	Participate
5. System Development	Program Design Program Code Program Test System Test Operations Manual User Manual Procedures Manual Training Manual Approval Authority Submission	Approve	Participate	Approve Approve Approve	Participate Participate Participate	Approve Approve Review Prepare	Review Review Participate Participate	Participate	Prepare Prepare Prepare Participate Participate
6. Implementation	Acceptance Test Conversion Production Operation Approval Authority Submission	Approve	Participate	Approve Approve	Perform Participate Perform	Prepare	Participate Participate	Participate Participate	Participate Participate
7. Post- Implementation Evaluation	Evaluation Report	Approve	Participate	Approve	Participate	Approve	Prepare		

3.2 Summary of Roles

Approval Authority

The Approval Authority for any information systems project may be a systems management committee, a project steering committee, the head of ISM (Information Systems Management) or a senior functional manager depending upon the nature of development project.

The Approval Authority acts on behalf of the user by approving each of the end-of-phase submissions, by allocating resources to each project phase, and by maintaining control over the project's progress. These responsibilities are exercised through periodic receipt of documents and submissions from both the Project Manager and the Systems Assurance Manager. Refer to the Departmental ISM policy manual for specific policies related to the approval process.

Business Systems Analyst

See: Systems Analyst

Data Analyst

A Data Analyst provides functional guidance and support to the project on matters related to the logical representation of data in project specifications. A Data Analyst is a specialist in data and data relationships. External to projects, he models the department in terms of its data for the purpose of developing efficient, cost effective data management facilities, e.g., data bases. In order to achieve this he must develop data models for each project application and synthesize them into the Departmental data model.

NOTE: The Data Analyst's role may not be a full-time staff position. The role may be filled by staff with other responsibilities.

Inspector

An Inspector reviews project specifications in order to assure their quality prior to release external to the project. In this regard he examines specifications for consistency in level of detail and style, and adherence to standards. He also looks for incompatibilities among related documents.

Depending upon the size of the project team and the volume of project deliverables, the Inspector may be one individual appointed for the duration of the project, or he may be any member of the project team (for example, a Systems Analyst) appointed for the inspection of a single document.

An Inspector should not review specifications which he developed.

Programmer

A Programmer designs, develops and tests program modules using structured programming techniques. He may also be required to perform duties in system testing, acceptance testing, conversion and post-implementation support.

See Programming Guide for further details.

Project Manager

The Project Manager has overall responsibility for achieving the project goals through the day-to-day conduct of the project. In this respect, he develops operational plans and budgets, acquires the required resources, identifies and organizes the appropriate business and technical expertise, periodically submits plans, requests for approval and progress reports to the approval authority, coordinates with user management and the Systems Assurance Manager user participation in the project, conducts regular project management progress meetings and ensures effective quality control over project deliverables.

See Project Management Handbook for further details.

Steering Committee

See: Approval Authority

Systems Analyst

A Systems Analyst identifies, analyzes and specifies information systems requirements using structured analysis techniques. He may also carry out ancillary duties involving user interface such as development of user manuals, training, system conversion, and acceptance testing. Systems Analysts may be members of a user section or branch (Business Systems Analyst) or may be drawn from ISM staff.

See Analysis Guide for further details.

Systems Assurance Manager

The Systems Assurance Manager represents the departmental interest in a systems project and is responsible for ensuring that all user-related matters pertaining to quality control are addressed. Acting on behalf of the user, the Systems Assurance Manager:

- . participates with the Project Manager in planning the commitment of user resources to the project;

- . ensures that the appropriate level and quality of user resources are available to the project (i.e., that sufficiently senior user personnel are assigned the key review and sign-off roles for all user-related deliverables produced by the project team);
- . ensures that the user community's participation is comprehensive and active;
- . verifies that the Project Manager has obtained user sign-off of all user-related deliverables (it is the responsibility of the Project Manager to obtain each sign-off);
- . verifies that any changes to project plans which impact the user community have been agreed and approved by the user community;
- . brings forward user concerns regarding the project to the Steering Committee for resolution if and when these concerns cannot be addressed through negotiations between the Project Manager and the user community;
- . reports to the Steering Committee on user satisfaction with the project.

Ideally, the Project Manager and the Systems Assurance Manager should work cooperatively to support the successful execution of the project. Situations may arise, however, in which the Project Manager and the Systems Assurance Manager disagree (i.e., the Systems Assurance Manager may request, on behalf of the users, the expansion of the project scope, beyond the terms of reference understood by the Project Manager). The Project Manager and the Systems Assurance Manager are jointly responsible for making every effort to resolve any such disagreements to the mutual satisfaction of the project team and the user community. Disagreements should be brought forward to the Steering Committee only when resolution cannot be achieved through negotiation.

System Designer

A System Designer transforms information systems requirements, in the form of functional specifications, into system and sub-system design specifications using structured design techniques. Although a System Designer is normally the designer of the computer internals - system transactions, screens, files, input, output, etc. - this role may also encompass design of user aids such as training packages and user manuals.

See Design Guide for further details.

Technical Specialist

A Technical Specialist provides functional support and guidance to the project on matters of a technical nature. These would include hardware studies, telecommunications networking, technical feasibility of design alternatives, and acquisition and use of development tools.

He is considered "external" to any project and his abilities are shared on an organization-wide basis. This is to optimize the economic efficiency of using specialized technical staff.

User

The User's role in the Systems Development Life Cycle relates to those activities which have direct impact on him and his area of responsibility. These include:

- . definition of systems subject matter;
- . planning and provision of subject matter expertise;
- . delegation of authority to staff assigned to participate in development activities;
- . quality control over subject matter documented by the project team;
- . training of staff;
- . preparation of administrative environment for system installation;
- . approval and acceptance of project deliverables.

In some sections or branches, user staff may also be engaged in carrying out development roles, such as systems analysis. These are not considered user roles.

SECTION 4

USER ROLES

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4. USER ROLES4.1 Introduction

The following roles are normally the responsibility of the user, whether or not information systems are developed. These are:

- . Project Initiation - Defining with ISM assistance the problem and its scope;
- . Planning - of resources falling within the user's sphere of control;
- . Familiarization - with System Development Life-Cycle Methodology and project roles;
- . Data Gathering) - these are in relationship to
) defining business processes and
) information requirements;
- . Quality Control)
- . Approval - acceptance of product or service.

Other roles currently staffed from user resources, such as project managers, analysts, or designers, which are strictly speaking development roles, are not specifically described in this guide. These are addressed in the set of project guides comprised of the:

- . Project Management Handbook;
- . Analysis Guide;
- . Design Guide; and
- . Programming Guide.

4.2 Project Initiation

The objective of Project Initiation is to document the general nature and scope of a systems development project. When a problem, requirement, or opportunity has been identified by user management, it should be documented in a Project Initiation Report. This report will provide the basis for continuing with a systems development project.

The manager responsible for initiating the project should contact the ISM manager in his region and request a meeting to discuss initiation of a systems development project. To prepare for the meeting, the manager should make brief notes on:

- . The nature and cause of the problem, requirement or opportunity;
- . The extent of the problem, (who is affected, and what existing systems are involved);
- . The objectives to be achieved;
- . The resources available (time, money, staff) to be applied toward developing a solution; and
- . The costs to be borne if no action is taken, and the possible benefits of a solution.

The meeting with the ISM manager will give the manager in the user area an opportunity to discuss the problem and to determine whether to pursue the matter. At the meeting the following should be done:

- . Review the System Development Life Cycle;
- . Discuss whether or not to proceed with the preparation of an Initiation Report;
- . Review the contents of the Project Initiation Report; and
- . Determine who will be assigned the responsibility for preparing the Initiation Report.

4.3 Planning

General

A way of looking at project planning is to consider planning as the constant tuning of three parameters which represent the three independent variables of the planning process:

- . the complexity of the work to be done;
- . the characteristics of the available resources;
- . the user's time constraints.

The planning process can be thought of as a dynamic forecasting model. Given values for any two variables, we can forecast project requirements in terms of the third variable. Looking at the possible combinations:

- . Given that task complexity and resources are fixed, we can forecast when the project is likely to be completed. We simply cannot accept a time constraint that is shorter than this forecast.
- . Given that task complexity and time constraints are fixed, we can forecast the resources which must be made available. We simply cannot accept a resource allocation that is less than this forecast. And we must keep in mind that, as Brook's Law states, there is a maximum resource assignment for a task of given complexity beyond which the assignment of additional resources will cause project elapsed time to be longer, rather than shorter.
- . Given that resources and time constraints are fixed, we can forecast the complexity of the task we will be able to achieve. We simply cannot accept a task of greater complexity than this forecast. In real life, this means that, if the time and resources are fixed, the user may be asked to trim the requirements before we will make a commitment.
- . Given that time constraints only are fixed, we can dynamically balance the resources and task complexity for greatest cost-effectiveness.
- . Given that task complexity only is fixed, we can dynamically balance the resources and schedule to make the most cost-effective use of resources, while ensuring that new system benefits are maximized.

- . Given that resources only are fixed, we can dynamically balance the task complexity and schedule for greatest cost-effectiveness.
- . And, finally, given the ideal situation that none of the parameters are fixed, we can optimize the project for most features in the new system, shortest time to completion, least use of resources, or whatever.

The process of project planning is not a one time activity consisting of listing all the tasks to be done, assigning them to available staff, and negotiating with the user a fixed schedule for the delivery of the system. It is an iterative process which is renegotiated by the Project Manager as the system evolves from each phase of the system development life cycle.

Planning of Each Phase

The Project Manager is responsible for developing an operational plan for each project phase and for the project overall. This involves negotiations with user management on schedules and resources.

For any planning submissions made through the information systems project approval process, non-project costs and dependencies are to be identified. The implication of this to user management is that the commitment and application of user resources in a project development must be formally planned. This is done in cooperation with project management who have overall responsibility for coordinating project related planning activities.

. Project Initiation

Detailed project planning starts during the Project Initiation phase. It is during this phase that the Project Manager or a (business) Systems Analyst with user management begins to plan the Feasibility Study phase and to secure user commitment to the plan. At this time the formal commitment goes no further than the end of the Feasibility Study phase.

. Feasibility Study

Planning during this phase is at two levels; detailed planning of the Analysis phase and preliminary planning for the project as a whole.

The detailed Analysis phase plan will identify extensive user participation. It is during the Analysis phase that business process requirements are identified, analyzed and specified by professionally trained project staff having specialist expertise for performing these tasks. User participation is more critical here than in any other phase because the user community, under the guidance of the project staff, must collectively define the identified business content of the system. The subsequent system and, if applicable, data base design is formulated on the specified requirements from the Analysis phase. The detection of analytical errors or omissions late in the system development life-cycle invariably causes heavy additional expenditure. For this reason user management must plan for comprehensive and active participation of staff in the Analysis phase.

Preliminary project planning requires that user management look ahead to the consequences of developing and implementing the conceptual design contained in the Feasibility Report.

Consideration must be given to the following questions:

- . Which staff will participate in the development process?
- . What are the changes in quantities and level of staff?
- . What plans need to be made for training of staff?
- . Is a different physical environment required? Are offices, furniture, or special equipment to be ordered?
- . What special preparations will be needed to convert to the new system, including acceptance testing? Is parallel operation of the old and new systems likely?
- . What other user costs will be incurred?

By considering these questions and with support from project management, managers will be able to identify the components of the user resource plans that must be developed as part of the overall project plan.

- . Analysis

Planning by users during the Analysis phase involves updating the user components of the overall project plan in light of the results of the Analysis phase.

Additionally, in conjunction with project management, the user's participation in the System Design phase is formulated as part of the detailed plan for that phase.

- . System Design and System Development

As in the previous phase, user management participates in the updating of the project plan. Particularly important during these two phases is the planning for pre-Implementation activity such as preparation of the office environment for installation of terminals and other equipment, acceptance testing, staff training, and preparation of files and data to be converted.

- . Changes to Plans

Once project plans are formally approved they represent a form of contract between the project and the user community. Any changes to plans which potentially impact dependent parties must be agreed upon between project management and user management. If these changes modify commitments made to the approval authority then formal approval for them must also be sought through the approval process.

4.4 Familiarization

There are many different roles in the development of an information system, especially if the system contains an EDP component. Furthermore, the functions of some of these roles change as the project progresses from one phase to another. This is the case with the user's role. The user's role in the life-cycle is further complicated because it is temporary in nature and is usually performed in addition to current line responsibilities. In order to maximize the value of their time on a project, some effort should be made by users to become familiar with the project, its aims and objectives and with the project roles and methods that are visible to the user community.

In the case of the methods, this does not mean that users should learn computer languages such as COBOL or FORTRAN (unless, of course, they also function in the role of programmer). They should, however, have a general understanding of the phases of a systems development project and what has to be done before a system is programmed and installed. For example, users may see some of the project's staff acting as systems analysts, and at other times as systems designers. It helps to speed the process if the user is familiar with the differences among the various roles.

The most difficult aspect for users to accept is the time needed for the planning and analysis activities. It is now realized that more time must be spent in studying and documenting the business processes and information needs of users, before deciding on the system design and on what hardware to acquire. This is not to say that business stops while this goes on. Clearly, short term information needs must be addressed speedily and in parallel with the longer term systems development activities.

One of the initial responsibilities of the project team is to examine user requirements in the context of the overall business. This imposes a structured environment in which business requirements can be studied and documented in a disciplined manner. The project team will be applying the phased approach of the System

Development Life Cycle Methodology to carry out their activities. While most of this approach will be internal to the project and thus invisible to users, there will be aspects, especially during the data gathering and analysis activities, which will be very apparent to the user community.

The user's primary responsibility in a project life-cycle is to consider and with other users define for the project team, the business requirements being addressed by the system and to examine and vouch for the accuracy of the requirements once they have been documented. Users who understand the aims and objectives of the project, the purpose of each role and the System Development Life Cycle Methodology, and the purpose of each user related activity, maximize the use of their own time, improve the efficiency of the development process and, more importantly, they help to achieve an effective implementation of the new system.

4.5 Data Gathering

Data gathering by project staff occurs at a general level during the Feasibility Study and at a detailed level during the Analysis phase. (General level data gathering of a similar nature also occurs during Systems Planning but is outside the scope of the life cycle of a development project). Data gathering is a pre-requisite to analysis in any phase of the system development life cycle.

The analysis technique practiced by project staff involves a "top-down" approach to data gathering. This requires the project staff to carry out data gathering activities among the user staff beginning with the top of the organization and working down, until precise details of requirements have been defined.

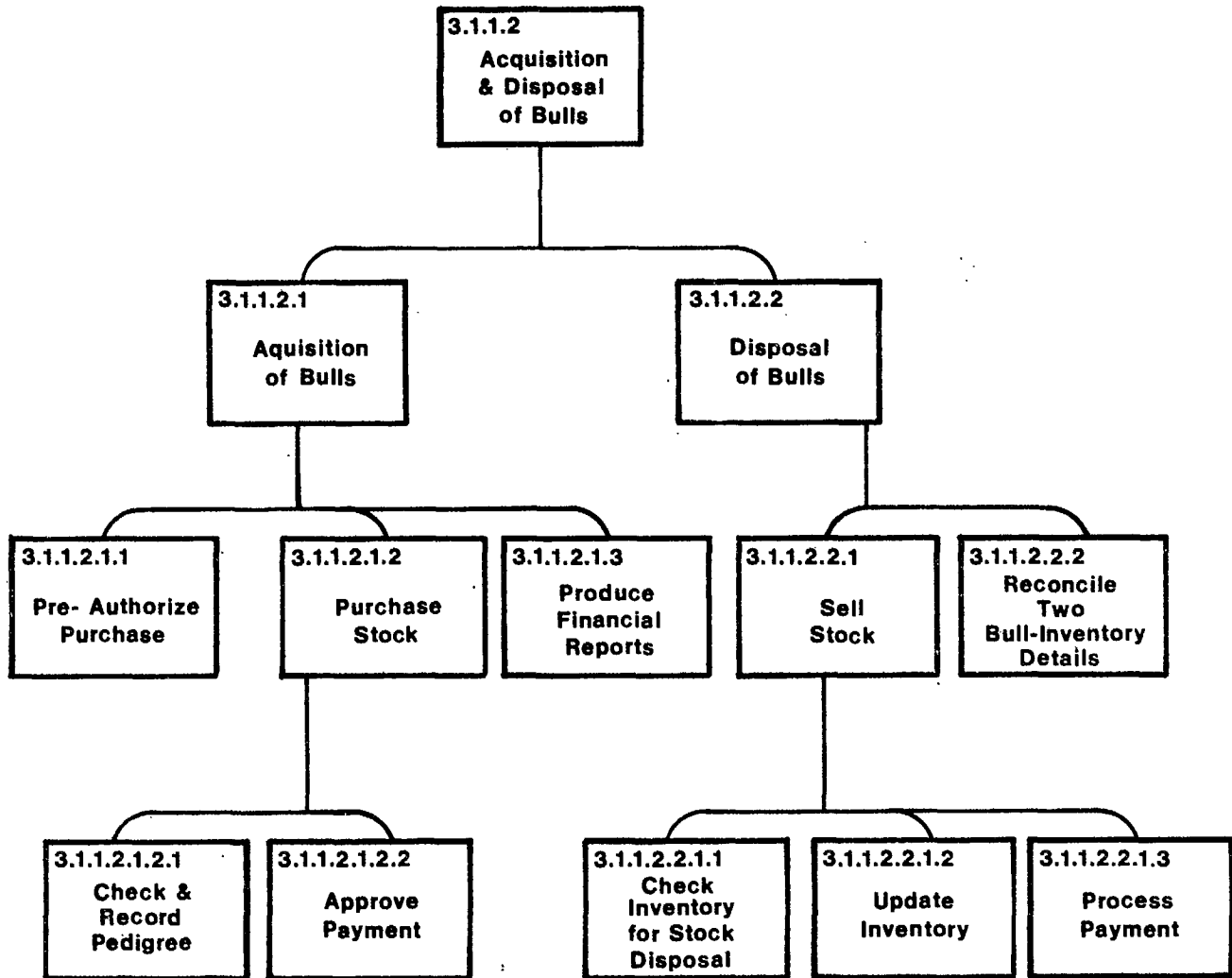
The objective of this technique is to develop a model of the business processes being addressed by the system development project. This model is then presented as a hierarchical structure of processes (see figure on next page), and subsequently forms the basis for developing a network of information or data flows which demonstrates the relationships among processes (see second figure following).

Project analysis starts with the insertion of the highest business process in the top box of the chart. This business process is then divided into its major sub-processes. Although a chart may initially look like an organization chart, it is business processes or functions which are being analyzed not organizational entities.

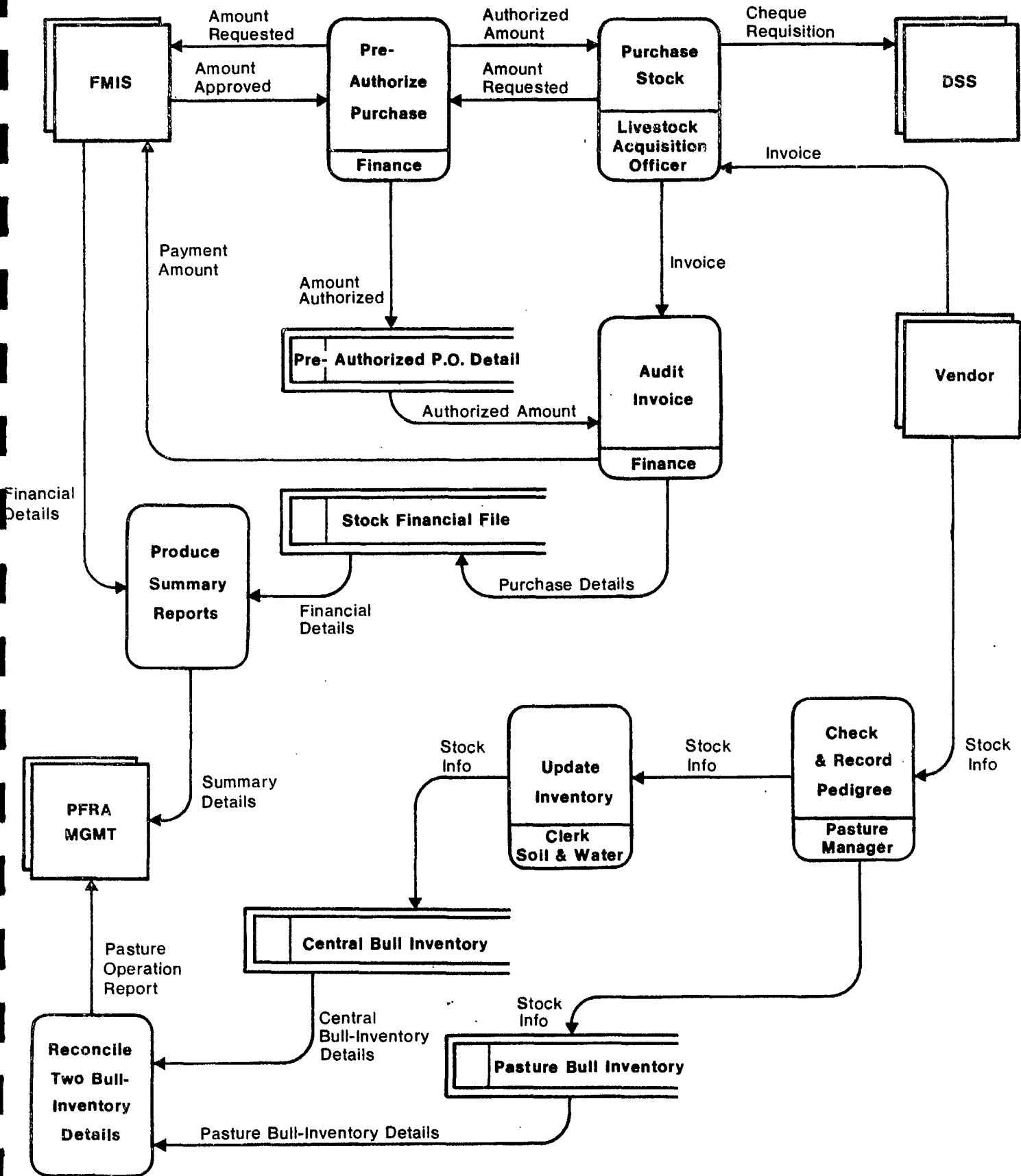
These sub-processes are then divided into further sub-processes until the elementary level is reached, where processes are discrete and need not be divided further. It is the elementary level of processes that the analyst will document very precisely by defining the steps in the process and the data manipulated.

In order to document from the top, down, the analyst first carries out interviews with key staff at the highest levels of the organization. These staff members provide the information requirements for their respective levels and this establishes the basis for subsequent interviews with subordinate staff. The analyst will be trying to determine:

ACQUISITION AND DISPOSAL OF BULLS



ACQUISITION OF BULLS PHYSICAL 3.1.1.2.1



- . what are the objectives of the interviewees job;
- . how are they achieved;
- . what processes and information are required;
- . what information is currently received;
- . what systems are in operation;
- . and other data concerning the business process. (For a complete Interview Checklist used by the analyst see Appendix A).

An analysis of the data which has been gathered will probably generate the need for further data gathering. Also, as the analysis progresses and the higher level processes are decomposed into sub-processes, more precise data gathering will be required. The more detailed data gathering is heavily dependent upon users' ability to provide input and review the specifications. Because of this requirement it is necessary that experienced and knowledgeable representatives be appointed to act on behalf of the other users in each functional area and that they be able to devote substantial time to the input and review processes.

The product of analysis is a general specification in the Feasibility Study phase and a detailed specification in the Analysis phase. As these documents are developed, users will be asked to attend "walk-throughs". Here the analyst presents charts and specifications to a group of key users in order to "walk" the group through the model of the business process being specified. A walkthrough is a formal session, where the goal is to establish that the documented material correctly reflects the business process. If it does not, then it must be corrected or further data gathering and analysis must occur.

4.6 Quality Assurance

Once specifications have been drafted by the analysts, users from each functional area will be requested to formally review them.

This involves examining documents in detail in order to verify them for accuracy and completeness. Any omissions or errors are to be documented and submitted to the analyst for resolution. On large projects which cross functional boundaries, users may be grouped into temporary umbrella organizations so as to coordinate their participation. In these cases it is likely that workshops and seminars will be conducted to review project output.

Documents that will be formally reviewed by the user community are the:

- . Initiation Report;
- . Feasibility Study (consisting of User Requirements and Conceptual Solution);
- . Functional Specifications (for details see Appendix B);
- . System Performance and Security Goals;
- . Report Formats, Screen Layouts, and Forms;
- . User Aid Design Specifications;
- . User Procedures, Manuals and Training Material; and
- . Acceptance Test Results.

In the case of acceptance testing, quality assurance will be effected by user preparation and execution of tests in a simulated production environment. Conversion to the new system can only occur after formal user acceptance of the system (or system component), which includes the acceptance of procedure manuals, training manuals, forms and equipment.

As part of the Post-Implementation Evaluation phase, users are asked to maintain records on the system's performance. Once the system has been in operation for a period of time, and start-up problems have been resolved, a report is prepared which evaluates the systems performance against the formally approved objectives and goals.

4.7 Approval

Each phase of the Systems Development Life Cycle ends with formal approval of the phase deliverables by senior management acting on behalf of the user. The level of approval will be dependent on the cost and significance of the project.

Details on which projects are subject to the various levels of approval are given in the ISM Policy Manual.

As part of the approval process, Management Audit may review the deliverables from each phase. A copy of the deliverables from the Project Initiation and Feasibility Study phases must be forwarded by the Project Manager, to Management Audit. Management Audit will then determine from a review of the Feasibility Report, whether or not they will review the deliverables from the Analysis and Design phases. Whether or not they review these deliverables they should become involved again in a detailed review of the system at the end of the Development phase, during system testing, before the operating system is delivered to the users. Finally, Management Audit should be involved in the Post-Implementation Review of the system, and may at times initiate the review.

SECTION 5

GLOSSARY

5. GLOSSARY

- Analysis - The study of business processes prior to designing and implementing a new system (whether automated or not).
- Analyst - Also Systems Analyst, Business Systems Analyst; a member of the project team responsible for performing analysis of business processes.
- Data Base - A collection of interrelated data, stored to serve one or more applications.
- Data Group - A collection of logically related data elements.
- Data Flow Diagram - A network of processes, interfaces and data stores logically related by the data flowing between them.
- Data Store - A place where data is stored between processes (may be a manual file, data base, table, conceptual file, etc.).
- Function Chart - Hierarchical model of the logical business processes being studied. As a general principle, it is free of organizational, geographical, systems and other physical characteristics. It is developed at various levels of detail during Systems Planning, the Feasibility Study and the Analysis phase.
- Functional Specifications - Documentation specifying details about a business process. For detailed contents see description in the Deliverables Reference Manual.

Problems, Requirements and Opportunities - Used in the context of Project Initiation to identify the issue being addressed by the project.

A problem is an area of difficulty currently existing.

A requirement is a characteristic of the business that must be satisfied by the system. Requirements typically arise because of policy or legislative changes.

An opportunity is a chance to include a desirable, but not necessarily essential, feature in the system.

System Development Life Cycle Methodology - The "what" and "how" of analyzing, developing and implementing information systems.

Walkthrough - A formal meeting held with the project team or with users to examine and correct a set of specifications or other project deliverables.

APPENDIX A

Interview Checklist

INFORMATION SYSTEMS - ANALYSIS

INTERVIEW CHECKLIST

General

General description of responsibilities and objectives:

- . current and planned.

Identify how responsibilities are accomplished:

- . current and planned
- . any special programs being developed?
- . obtain organization chart and staff names
- . continue development of organization's function chart.

What information is needed to plan, to solve problems and to make decisions?

- . how does information relate to objectives?
- . identify performance indicators
- . what is relative priority and importance of information needs?
- . avoid information needs not within scope of study

What information is actually received?

- . current and planned

What systems are being utilized?

- . current and planned
- . obtain sufficient information to sketch out a data flow diagram

What level of performance and availability would be expected from a computerized facility?

Identify other general problems and their impact.

Identify opportunities for improvement.

Specific

Determine characteristics of information needs:

- . when is it needed?
- . what is the required frequency?
- . where does it originate?
- . what are the volumes?
- . when and where do the peaks and valleys of volumes occur?

Obtain information on data classes and, ultimately, data elements and their definitions.

Obtain information on detailed processes (if examining operational processes).

Obtain specific turnaround times, data security requirements, information archiving needs, and names of approval authorities.

Request samples of the following:

- . forms
- . documents
- . reports
- . user manuals
- . procedure manuals

APPENDIX B

Functional Specifications
User Review Information

(for distribution among users at the time of
formally reviewing Functional Specifications)

FUNCTIONAL SPECIFICATIONS

USER REVIEW INFORMATION

1. Functional Specifications

Functional Specifications are the product of analysis, and serve the following purposes:

- . they are the means by which the business information requirements and processes to be addressed by the system are documented
- . they form the primary input to the System Design phase of any project
- . they define the scope of the business that subsequent project phases are concerned with, and thus provide part of the criteria against which the product of these phases may be tested
- . they provide, initially, a framework for obtaining broad user involvement in the definition of the business content
- . they describe, in general terms, current methods of performing these processes
- . they outline the proposed user system and identify processes which are to be computer assisted

Functional Specifications do not:

- . describe in detail current systems
- . describe in detail the proposed system; this is described during the System Design phase
- . specify reports or screen layouts; where these appear in Functional Specifications they are inserted to aid in the understanding of that particular module; screen layouts/reports will be agreed upon with users during the System Design phase.

2. Analysis

Analysis, in this context, is the process by which the pure business requirements are identified, analyzed and specified. This process is executed with no preconceived notions of organizational structures, systems or procedures which may be required to perform the processes which make up these business requirements. In this sense, analysts examine the 'what' of the system.

Subsequent to defining of the 'what', computer-oriented technicians - systems designers - work with analysts in transforming Functional Specifications into system design documents. It is during this System Design phase that the organizational realities of the user are matched with the functional requirements, and system solutions are designed. In this context, system designers are concerned with specifying the 'how' of the system.

In summary, the Analysis phase deals with the business problem, whereas the Design phase deals with the business solution. The products of both these activities require user approval.

3. Methodology

There are a number of reasons for the structured approach to analysis, here are the major ones:

- A. Many large systems development projects have run into serious difficulties because major design decisions were made prematurely. Designers must base their decisions on a comprehensive understanding of the business and have available to them a detailed definition of the business system requirements. Costly modifications and delays during later stages of the development life cycle may be the consequence of, for example, premature selection of computing equipment, or of designing a data base too early.

- B. Many systems now being developed are large, complex, Department-wide systems. Often they have a diversity of users accessing data derived primarily from a single source - the operations of the user. Across organizational and functional boundaries, users will share the same data and systems. From these perspectives, the system must integrate the processes with the objective of ensuring that there is consistency and compatibility of information disseminated throughout the organization.

The Analysis methodology permits analysis of the business to be structured, which in turn enables an integrated representation of the identified processes. Analysis starts at the top. It identifies, in very basic terms, the overall objective of the user. Through the analysis process, it then proceeds to identify at the next and subsequent lower levels, functions that have to be executed in order to achieve the more general higher level objectives. The aim is to build, in the first instance, a hierarchy in terms of the Department's business processes. That is to say, a hierarchy of what must be done without presuming how it will be done.

- C. Analysis is often carried out by teams of analysts. The products of their work must be scrutinized and validated by a broad cross-section of the users community. For these undertakings to have unity and purpose and to enable effective management, the methods used must be structured.

The Analysis methodology has been developed to address the problems of controlling a large scale effort by facilitating the division of assignments into manageable portions.

4. Review

The purpose of the review process is to validate that the Functional Specifications represent the business requirements to be addressed by the Design phase and that they are complete and accurate.

5. Approval

Sign-off of Functional Specifications by properly authorized personnel is a major project milestone and serves the following purposes:

- . it affirms that the business requirements to be addressed by the system are fully described;
- . it permits the System Design phase to proceed to completion; and
- . it provides a 'freeze-point' from which further amendments may be controlled.

