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## **UNIT 2 PROJECT SELECTION**

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### **2.0 INTRODUCTION**

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Systems analysts do not start working on any projects they desire.<sup>1</sup> They receive a lot of requests **from** the management for starting different type of projects. When projects are formally requested, the **systems analysts**, under the **management's** direction, conduct a **preliminary** investigation to **analyse** the reasons for the request and collect various facts to **respond** to the request in a systematic way. Some projects are feasible, while others many not be feasible for various reasons.

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### **2.1 OBJECTIVES**

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After going through this unit you will be able to :

- describe **different** reasons for developing new systems projects
- state the different sources of project requests
- discuss how to select a project out of a number of project requests
- explain **something** about the preliminary **investigation** to see the feasibility of a project
- discuss problem classifications and definitions.

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### **2.2 WHY .SYSTEM PROJECTS?**

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Systems projects **are initiated** for different reasons. The most **important** reasons **are**:

## (a) CAPABILITY

Business activities **are influenced** by an organisation's ability to process **transactions** quickly and efficiently. Information systems add capability in three ways:

- (i) Improved **processing** speed: The inherent speed with which computers process **data** is one reason why organisations seek the development of systems projects.
- (ii) Increased volume: Provide capacity to process a greater amount of activity, perhaps to take advantage of new business opportunities.
- (iii) Faster retrieval of information: Locating and retrieving information from storage. The ability in conducting complex searches.

## (b) CONTROL

- (i) Greater accuracy and consistency: Carrying out computing steps, including arithmetic, **correctly** and consistently.
- (ii) Better security: Safeguarding sensitive and important data in a form that is accessible only to **authorised** personnel.

## (c) COMMUNICATION

- (i) Enhanced communication: Speeding the flow of information and messages **between** remote locations as well as within **offices**. This includes the transmission of **documents** within offices.
- (ii) **Integration** of business areas: Coordinating business activities taking place in separate areas of an organisation, through capture and distribution of information.

## (d) COST

- (i) **Monitor costs**: Tracking the costs of labour, goods and overhead is essential to **determine** whether a firm is performing in line with expectations - **within** budget.
- (ii) Reduce costs: Using computing capability to process data at a lower cost than possible with other methods, while maintaining accuracy and performance levels.

## (e) COMPETITIVENESS:

- (i) Lock in customers: Changing the relationship with and services provided to customers in such a way that they will not **think** of changing suppliers.
- (ii) Lock out **competitors**: Reducing the chances of entering the competitors in the same market because of good information systems being **used in the organisation**.
- (iii) Improve **arrangements** with suppliers: Changing the pricing, **service or delivery** arrangements, or relationship between suppliers and the **organisation** to benefit the firm.
- (iv) New product development: Introducing new products with **characteristics** that use or are **influenced** by information technology.

## 2.3 SOURCES OF PROJECT REQUESTS

There are mainly four **primary** sources of project requests. The requesters inside the **organisation** are: Department **Managers**, Senior Executives and Systems Analysts. In addition, government agencies outside the organisation may also ask for information systems projects.

### 2.3.1 Requests from Department Managers

Frequently, department managers who deal with day-to-day business activities, **are** looking

for assistance within their departments. They are often not satisfied with the amount of time that the staff takes to complete the job. Sometimes, they feel that the staff members are involved in duplication of work also. In this case, the manager will discuss this problem with other administrators regarding their clerical as well as processing work and persuade higher authority to approve the development of a computer based system for office administration.

### **2.3.2. Requests from Senior Executives**

Senior executives like presidents, vice-presidents usually have more information about the organisation as compared to department managers. Since these executives manage the entire organisation, so naturally they have broader responsibilities. Obviously, systems project requests submitted by them carry more weightage and are generally broader in scope also.

### **2.3.3 Requests from System... Analysts**

Sometimes systems analysts find areas where it is possible to develop projects. In such cases, they may prefer either writing systems proposal themselves or encouraging a manager to allow the writing of a proposal on their behalf. For instance, in an organisation, an analyst sees that the library information system takes more time in processing and is inefficient, may prepare a project proposal for a new library information system. By the direction of the analyst who is fully aware about the new technology that improves the existing library information system, the librarian may initiate the development of information system to the higher authority for approval.

### **2.3.4 Requests from Outside Groups**

Developments outside the organisation also lead to project requests. For example, government contractors are required to use special cost accounting systems with government stipulated features. Generally, it has been observed that new demands from external groups bring about project requests, either for new systems or changes in current ones. Project requests originated from this source are also quite important.

#### **Check Your Progress 1**

1. Name some important reasons for system projects.

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2. What are the three ways by which information systems and capability are related with each other?

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3. Name some primary sources of project requests.

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4. Discuss some reasons due to which a Department Manager request for development of a computer based system for his office.

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- ii) How can project requests be evaluated? Process for the initiation of system projects

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## 2.4 MANAGING PROJECT REVIEW AND SELECTION

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It is true that a number of requests for systems development are generated in the organisation. Someone in the organisation must decide which requests to pursue and which to **reject**. The criteria to accept or reject a request can be decided in a **number** of ways. One of the suitable methods commonly in use is by committee. Mainly three committees formats are commonly used :

- (i) Steering Committee
- (ii) Information Systems Committee
- (iii) User-Group Committee

### 2.4.1 Steering Committee,

This is one of the most common methods of reviewing and selecting projects for development. Such a committee, consisting of key managers from various departments of the organisation as well as members of information systems group, is responsible for supervising the review of project proposals. This committee receives requests for proposal and evaluates them. The main responsibility of the committee is to take decision, which often requires more information than the proposal provides. It is, therefore, desired to have preliminary investigation to gather more details. The steering committee approach is generally favoured because systems projects are considered as business investments. Management, not systems analysts or designers, selects projects for development. Decisions are made on the basis of the cost of the project, its benefit to the organisation and the feasibility of accomplishing the development within the limits of information systems technology.

### 2.4.2 Information Systems Committee

In some organisations, the responsibility for reviewing project requests is entrusted to a committee of managers and analysts in the information systems department. Under this method, all requests for service and development are submitted directly to a review committee within the information systems department. This committee approves or disapproves projects and sets priorities, indicating which projects are most important and should receive immediate attention. This method can be used when many requests are for routine services or maintenance on existing applications. When major equipment decisions are required or when long-term development commitments are needed to undertake a project, the decision authority is shared with senior executives who decide finally whether a project should proceed or not,

### 2.4.3 User-Group Committee

In some organisations, the responsibility for project decisions is entrusted to the users themselves. Individual departments hire their own analysts and designers who handle project selection and carry out development. Although the practice of having user committees both choose and develop systems does take some of the burden from the systems development group, it can have disadvantages for the users. Some user groups may find themselves with

defective or poorly designed systems that require additional time and effort to undo any damage caused by the mis-information that such systems could generate. Although user groups may find the decisions of steering committees and information systems committees disappointing at times, the success rate for users who undertake development job is not very encouraging.

#### 2.4.4 The Project Request

The project proposals submitted by the users or the analysts to the project selection committee is a critical element in launching the systems study. There is a general agreement that a project request form should contain the following:

- What is the problem?
- What are the details of the problem?
- How significant is the problem?
- What does user feel is the solution?
- How will the information systems help?

Who else knows about this and could be contacted?

The project selection committee is responsible to review the proposals carefully and finally selects those projects which are most beneficial to the organisation. Therefore, a preliminary investigation is often requested to gather details which are asked in the project request forms.

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## 2.5 PRELIMINARY INVESTIGATION

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The first step in the system development life cycle is the preliminary investigation to determine the feasibility of the system. The purpose of the preliminary investigation is to evaluate project requests. It is not a design study nor does it include the collection of details to describe the business system in all respect. Rather, it is the collecting of information that helps committee members to evaluate the merits of the project request and make an informed judgement about the feasibility of the proposed project.

Analysts working on the preliminary investigation should accomplish the following objectives:

- clarify and understand the project request.
- determine the size of the project.
- assess costs and benefits of alternative approaches.
- determine the technical and operational feasibility of alternative approaches.
- report the findings to management; with recommendations outlining the acceptance or rejection of the proposal.

### 2.5.1 Conducting the Investigation

The data that the analysts collect during preliminary investigations are gathered through three primary methods : reviewing organisation documents, on-site observations and conducting interviews.

#### Reviewing Organisation Documents

The analysts conducting the investigation first learn about the organisation involved in, or affected by the project. For example, to review an inventory systems proposal means knowing first how the department works and who are the persons directly associated with inventory system. Analysts can get some details by examining organisation charts and studying written operating procedures. The procedures clearly define various important steps involved in receiving, managing and dispensing stock.

## On-site Observations

Another important technique to collect data is on-site observation. In this method, the analysts observe the activities of the system directly. One purpose of on-site observation is to get as close as possible to the real system being studied. During on-site observation, the analyst can see the office environment, work load of the system and the users, methods of work and the facilities provided by the organisation to the users.

## Conducting interviews

Written documents and the on-site observation technique tell the analysts how the system should operate, but they may not include enough details to allow a decision to be made about the merits of a systems proposal, nor do they present user views about current operations. Analysts use interviews to learn these details. Interviews allow analysts to learn more about the nature of the project request and the reason for submitting it. Interview should provide details that further explain the project and show whether assistance is merited economically, operationally and technically.

### 2.5.2 Testing Project Feasibility

Preliminary investigation examine project feasibility, the likelihood the system will be useful to the organisation. Three important tests of feasibility are studied and described below:

- operational feasibility
- technical feasibility
- economic feasibility

#### Operational Feasibility

Proposed projects are beneficial only if they can be turned into information systems that will meet the operating requirements of the organisation. This test of feasibility asks if the system will work when it is developed and installed. Are there major barriers to implementation? Some of the important questions that are useful to test the operational feasibility of a project are given below:

- Is there sufficient support for the project from the management? From users? If the present system is well liked and used to the extent that persons will not be able to see reasons for a change, there may be resistance.
- Are current business methods acceptable to the users? If they are not, users may welcome a change that will bring about a more operational and useful system.
- Have the users been involved in the planning and development of the project? If they are involved at the earliest stage of project development, the chances of resistance can be possibly reduced.
- Will the proposed system cause harm? Will it produce poorer result in any case or area? Will the performance of staff member fall down after implementation?

Issues that appear to be quite minor at the early stage can grow into major problem after implementation. Therefore, it is always advisable to consider operational aspects carefully.

#### Technical Feasibility.

There are a number of technical issues which are generally raised during the feasibility stage of the investigation. They are as follows:

- Does the necessary technology exist to do what is suggested (and can it be acquired)?
- Does the proposed equipment have the technical capacity to hold the data required to use the new system?
- Can the system be upgraded if developed?

Are there technical guarantees of accuracy, reliability, ease of access and data security?

A system that can be developed technically and that will be used if installed, must still be profitable for the organisation. Financial **benefits** must equal or exceed the costs. The analysts raise various financial and economic questions during the preliminary investigation to estimate the following:

- The cost to **conduct** a full systems investigation.
- The cost of hardware and software for the class of application being considered.
- The benefits in the form of reduced costs or fewer costly errors.
- The cost if nothing changes (i.e. the proposed system is not developed).

To be judged feasible, a proposal for the **specific** project must pass all these tests. Otherwise, it is not considered as a feasible project.

## 2.53 Handling Infeasible Projects

It is not necessary that all projects that are submitted for evaluation and review are acceptable. In general, requests that do not pass all the feasibility tests are not pursued further, unless they are modified and re-submitted as new **proposals**. In some cases, it so happens that a part of a newly developed system is unworkable and the selection committee may decide to combine the workable part of the project with another feasible proposal. In still other cases, preliminary investigations produce enough new information to suggest that improvements in management and supervision, not the **development** of information systems, are the actual solutions to reported problems.

## 2.6 PROBLEM CLASSIFICATIONS AND DEFINITIONS

One of the most difficult tasks of system analysis is developing a clear, in-depth understanding of the problem being investigated, without which it becomes impossible to specify the requirements for a new project with any accuracy. Several questions should be posed for this. Some of those may be:

- i) **What** is the problem?
- ii) How complex is it?
- iii) **What** are its likely causes?
- iv) Why is it important that the problem be solved?
- v) What are possible solutions to the problem?
- vi) What types of benefits can be expected once **the** problem is solved?

### 2.6.1 Defining a Problem

It takes considerable skill to determine the true cause of a systems problem. A systems analyst might **begin** to define the problem by determining if **the** problem can be classified according to one or more common types of systems problems. With a knowledge of the common **types** of problems, the analyst can diagnose a problem by examining its **characteristics**. The following example illustrates this finding.

A manager comments, 'We **need** a new budgeting **system**. **Ow** current one seems to vary in **quality from** one month to the next. Besides, reports are often late, have errors, and **contain** misleading **information**. Why we must spend a **fortune** simply trying to keep **the** system **up** and going."

Careful analysis of this statement suggests a number of different problems, the problem of reliability (the system varies in quality from one month to the next), the problem of **accuracy**

(there are too many errors), the problem of timeliness (reports are often late), the problem of validity (reports contain misleading information), and the problem of economy (the system is costly to keep up and going).

Besides the problems of reliability, validity, accuracy, economy and timeliness, the problems of capacity and throughput are also common. Capacity problems occur when a component of a system is not large enough. Two people attempting to do the work of six illustrates a capacity problem. Throughput problems deal with the efficiency of a component of a system. Six people doing the work of two represents a problem of throughput. Let's consider each of these seven problems in more detail.

(a) **The Problem of Reliability:** A system suffers from the problem of reliability when procedures work some but not all of the time, or when use of the same procedure leads to different results. Analysts must work continually to improve the reliability of systems.

They strive to do this by running software tests to document that two runs of a computer program lead to identical results, by selecting equipment with low failure rates, and by monitoring processing schedules to ensure that results are on time. With some systems, reliability is essential. Imagine a payroll system that only works some of the time, or for that matter the railway or airlines reservation system.

(b) **The Problem of Validity:** Systems that produce invalid results are often most troublesome to users and systems managers. These systems might be highly reliable. They may work all of the time, but they draw incorrect conclusions. A report might show that demand is increasing and that additional stock should be ordered for inventory. If these conclusions are wrong and demand is actually decreasing, then the stock is unnecessary and the whole operation becomes less efficient.

Maintaining validity in computer software is a troublesome design problem. The objective in design is to produce a flawless product, one that will always reflect actual events. Validity problems result when the environment changes and these changes are not incorporated into the software. As an example, suppose a measure of consumer satisfaction must be placed in a computer program. If the measure is incorrect, the software will draw incorrect conclusions.

(c) **The Problem of Accuracy:** The problem of accuracy is similar to the problems of reliability and validity. A system is inaccurate when processing is error-prone. For example, assume that several people are required to post company expense transactions against departmental budget numbers. If the posting procedure is complex and the number of transactions large, a fair number of errors may occur (for example, 1 percent of all transactions). Because of inaccuracy, the entire budget system might be viewed as unreliable and often invalid. However, these are symptoms of the real problem - namely, the problem of accuracy. Routine transaction-based manual procedures are basically suitable for conversion to computer-based methods of processing because the computer is far more accurate than human beings, provided that software is written properly.

(d) **The Problem of Economy:** Besides improving processing accuracy, organisations seek to improve processing economy. A system suffers from the problem of economy when existing methods of transmitting, processing, and storing information are very costly. An organisation might discover that the cost of handling the paperwork associated with each purchase order is Rs 25. This cost is determined to be a problem of economy. After the installation of a new method of processing, the cost per purchase is substantially reduced - from Rs 25 per order to Rs 8 per order.

Projects with clear-cut savings are likely to be considered suitable for conversion to computer-based methods of processing. Much like the problem of accuracy, the problem of economy is relatively easy to identify. The danger with the problem of economy is the naive assumption by both users and system managers that the computer will eliminate the cause of the problem. Budget managers will say that this assumption is not always true; they will report that some project cost far more than they return. Thus, before moving ahead on a project assignment, the analyst must ask, "Is the project worth doing?" A partial answer to this question follows from determining the return on the investment expected from the project. If the return is low, more economical projects should be selected.

(e) **The Problem of Timeliness:** The problem of timeliness relates more to the transmis-

sion of information than to the processing or storing of it. A system suffers from the problem of timeliness if information is available but cannot be retrieved when and where it is needed. As people become more familiar with information systems and how they function, they generally realize how much easier it is to process and store information than it is to retrieve it.

Organisations have committed extensive resources to handle the problem of timeliness in recent years. Fingertip access to information has been the desired objective. The findings to date show that only modest success has been achieved in improving this problem area. Only when retrieval problems are small and well defined has the overall success rate improved.

- (f) The Problem of Capacity: The problem of capacity occurs when a system component is not large enough. Capacity problems are specially common in organisations that experience peak periods of business. During peak-periods, inadequate processing capacity, transmission capacity, storage capacity, staff capacity, and the like may all exist. Capacity problems are also evident in rapidly growing organisations. With growth, smaller-capacity equipment soon becomes too small; smaller staff groups soon become overworked. In either case, some expansion is needed to handle the increasing volume of business.

Many system problems are directed at solving capacity problems. Because it is often difficult to justify the purchase of new equipment or the hiring of new staff, people tend to put off such decisions until the very last moment. Consequently, when the systems group is contacted, the problem of capacity is easy to spot; the difficulty, however, lies in knowing how to handle the problem. For example, an analyst might be forced to suggest a short-term solution to the problem. This is done to gain time toward the formulation of a longer-term solution. For instance, an analyst might recommend: "Let's hire five part-time employees to help us get through the peak period." When a short-term approach fails, the analyst may be tempted to implement a quick-fix computer-based solution. Unfortunately, this solution carries with it the associated danger of creating an even more severe system problem in the near future.

- (g) The Problem of Throughput: The problem of throughput may be viewed as the reverse of the problem of capacity. Throughput deals with the efficiency of a system. If system capacity is high and production low, a problem of throughput occurs. Consider the following example.

Five programmers are assigned to a fairly straightforward programming assignment consisting of 10,000 lines of computer code. After thirty days of coding, the programming team is evaluated. It is discovered that they have completed 6000 usable lines of code. Now, if each programmer worked eight hours a day, a total of 1200 hours would have been expended on the project. Calculated differently, the average production rate for each programmer would be 5 lines of code per hour (6000 lines divided by 1200 hours). These findings might lead the analyst to conclude that there is a problem of throughput.

Similar to the problem of capacity, the problem of throughput may be much easier to spot than to treat. When repeated equipment breakdowns lead to low rates of production (and when the equipment has been purchased and cannot be returned), an organisation can badger the vendor into fixing the equipment but can achieve little more short of legal action. Likewise, when groups of people exhibit low rates of production, such as the five-person programming team, the problem becomes even more complicated. Badgering and threats may not work at all. Rather, a manager must be able to determine the root of the problem for any improvement in throughput.

## 2.6.2 Evaluating the Problem

Suppose that a problem has been identified. The next step is problem evaluation, which consists of asking the following questions: Why is it important to solve the problem? What are possible solutions to the problem? What types of benefits can be expected once the problem is solved? There will be times when an analyst will recommend that no project be started to resolve a problem, as the next example demonstrates.

Suppose that an analyst discovers that the real problem lies with the supervisor of an area. Because of mistakes made by this man, the throughput rate is 20 percent less than had been

expected. However, suppose next that the supervisor is new to the job, is smart enough to realize where mistakes were made, and knows how not to repeat them in the future. Given this situation, the analyst might close the book on this project, recommending that no action be taken at this time.

Consider a different set of circumstances. Suppose that an analyst determines that a problem of low throughput can be traced to a computer printer. Suppose further that the problem must be corrected. Once the problem has been identified, the analyst would prepare a solutions table to list possible problem solutions and the expected benefits from each. Sometimes, the best solution is not at all evident. The analyst might recommend that further study is required to determine which of the possible solutions is best.

In this section, we have spent considerably more time examining how an analyst identifies a problem compared with how the problem is evaluated. This uneven split also occurs in practice. As a general rule, analysts spend 75 percent of the project-definition phase of analysis defining the problem and 25 percent evaluating and documenting their findings. Note also that we have limited our discussion to seven major types of system problems. Because of this limitation, you might ask, "What about the problems of communication? of group conflict? of management? of system security? Are these problems as well? Are these types of problems also evaluated by the analyst?" Although our discussion has been restricted to more technical system problems, individual or group problems also occur in a systems environment and require identification and evaluation.

Still another limitation is the coverage given to determining the feasibility of taking some action to solve a problem. The concept of feasibility entails the joint questions of "Can something be done?" and, if so, "Should it be done given a particular set of circumstances?" For example, is it possible to climb a mountain when we have at our disposal only a forty - foot rope? If it is, a second question is well advised, namely, "Should we attempt such a climb given the size of our rope?" We will examine the question of project feasibility in more detail in the next unit of this block.

A final limitation is the coverage given to tools which the analyst can use to identify and evaluate system problems. These tools are needed when the problems are not self-evident.

Organisations face various types of problems during their course of operations and come across opportunities or situations which could be converted into profitable solutions. Whenever there is an opportunity and/or problem in the existing system of operations or when a system is being developed for the first time, the organisation considers designing a new system for information processing.

### 2.6.3 Sources of Problem/Opportunity

Organisations usually face problems or have opportunity due to the following:

- a new product or plant or branch
- a new market or new process
- failure of an existing system
- inefficiency of an existing system
- structural error in the existing system, etc.

Thus a thorough analysis of the situation need to be required. Not only the above listed reasons but there exist some organisation based reasons tw.

### 2.6.4 Problem Identification and Definition

For identifying problems/opportunities, we scan the following:

- the performance of the system
- the information being supplied and its form
- the economy of processing
- the control of the information processing

- the efficiency of the existing system
- the security of the data and software
- the security of the equipment and personnel, etc.

After identification of the problem, it is defined and a general direction or method for solving this problem is also **determined**. Then project boundaries are defined. The management establishes the term of reference as well as the resources to be provided for the project. System development is an iterative process and the first identifiable stage of it is Problem Definition, whose final output is Terms of Reference.

### Check Your Progress 2

1. Name the three committees by which review of projects can be done.

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2. A project request form should contain information to some basic questionnaire.  
List some of those.

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3. (a) What are the objectives the analysts should accomplish during preliminary investigation?

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- (b) How the data are gathered?

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4. Which are the causes for which organisations usually face problem (or have opportunity)?

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## 2.7 SUMMARY

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In this unit, we have discussed first of all the various possible reasons for system projects. You know here what is the necessity of system projects, why system projects are initiated etc. Then comes in section 2.3 the various sources who initiate system projects and the reasons for system projects from different angles (In the previous section a general discussion was made; here you study the reasons for system projects which vary from its source to source). Now suppose, project proposals are submitted. How to make a good review of all

the projects and how to select or reject project proposal? These are discussed in section 2.4. For this purpose some committees(mainly three) are there. There role/activities are also discussed. The very first step in the System Development Life Cycle is the preliminary investigation to analyse the feasibility of the system. There are different stages to determine the overall feasibility, and you study this in section 2.5. In the section 2.6 various types of problems are pointed out and defined. For your own satisfaction you get some straightforward questions under Check Your Progress 1 and 2, whose model answers you find below.

## 2.8 MODEL ANSWERS

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### Check Your Progress 1

1. Some important reasons for system projects are capability, control, communication, cost and competitiveness.
2. Information system and capability are related to each other in three ways:
  - (i) Improved processing speed
  - (ii) Increased volume of activities
  - (iii) Faster retrieval of information
3. Some primary sources of project requests are:
  - (i) Requests from department managers
  - (ii) Requests from senior executives
  - (iii) Requests from system analysts
  - (iv) Requests from outside groups.
4. A Department Manager requests for development of a computer based system for his office for various reasons. The most important reason in case of any manager is the amount of time taken to accomplish different jobs. Certainly, if his office is computerised he will be able to have more output at the cost of equal man-hour. Similarly, Job scheduling, parallel works etc. can also be done by his computer based system, specially when the data to be processed are very large.
5. For speeding up the transmission of important messages and information within his office as well as in remote branches of his organization, "communication" is considered to be a reason for initiating a system project.

### Check Your Progress 2

1. The main three committees are Steering Committee, Information System Committee and User-Group Committee.
2. A project request form should contain some basic questionnaire. Some of those may be the following:
  - (i) What is the problem?
  - (ii) What are the details of the problem?
  - (iii) How significant is the problem?
  - (iv) What does the user feel is the solution?
  - (v) How will the information systems help?
  - (vi) Who else knows about this and could be contacted?