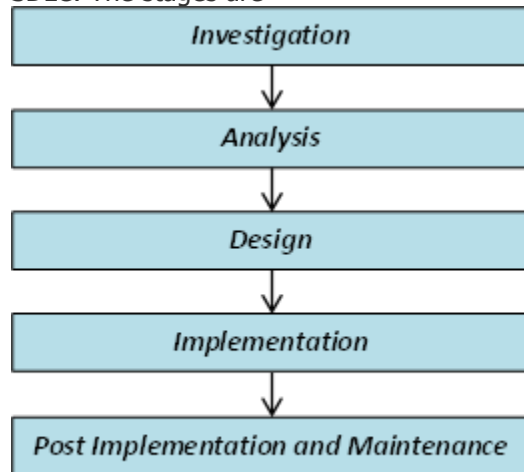**Q. What is SDLC? Describe the stages of SDLC.** 2019 1c   2018 2a   2016 2b   2015 2a

Ans: SDLC (System development life cycle): The multistep process to develop a system is called SDLC. The stages are –

```
┌─────────────────────────────────┐
│          Investigation          │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│            Analysis             │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│             Design              │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│         Implementation          │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Post Implementation and Maintenance │
└─────────────────────────────────┘
```
Fig: SDLC

How does it relate to systems analysis?

- **Investigation:**
  - Recognition of need for changes is needed for preliminary survey to determine whether a problem or opportunity exists.
  - A feasibility study is a test of a system proposal according to its user needs, use of resources, cost / benefits estimation. The result of the feasibility study is the formal proposal.

The key question is "*what is the problem?*"

- **Analysis:** Analysis is a detailed study of the various operations performed by a system. This stage also involves information gathering and uses various structured tools (DFD, Decision tree etc) for analysis. It provides the functional requirements of a system. The key question is – "*what must be done to solve the problem?*"
- **Design:** The key question is – "how could the problem be solved?" Design phase determine how the o/p is to be produced and in what format. I / p and master file have to be design to meet the requirements of the proposed o / p. hardware and s / w specification is also determined.
- **Implementation:** Development (coding) of the system, testing, preparing documentation, training people to operate and use it.
- **Post – implementation and maintenance:** It monitors, evaluates and modifies the system as needed.

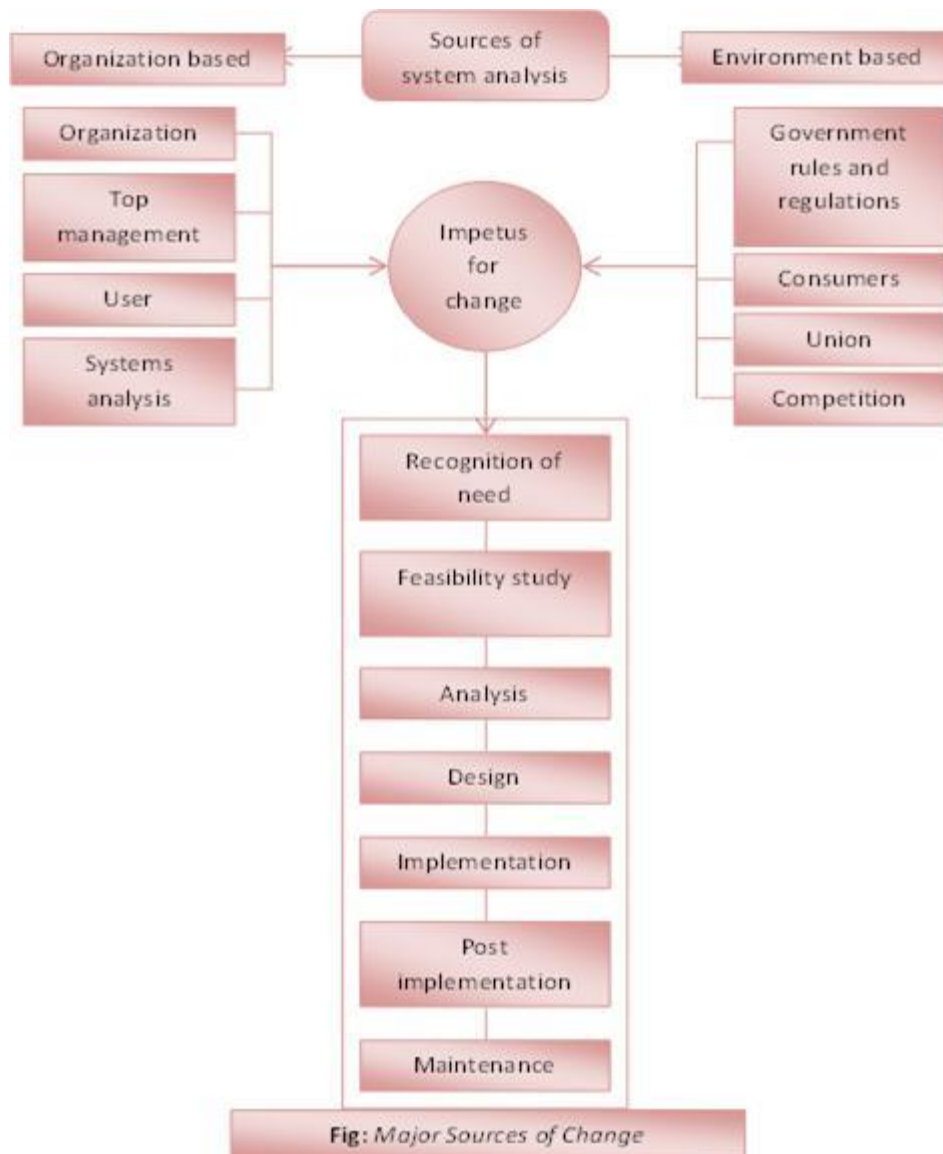**Q. Write key questions and results in each fetch of SDLC.**
Ans: The key questions and results in each fetch of SDLC are given bellow:

Stage	Key question	Result
1. Recognition of need Preliminary survey / Initial investigation	What is the problem or opportunity?	Statement of scope and objectives. Performance criteria.
2. Feasibility study Evaluation of existing	What are the user's demonstrable needs?	Technical / behavioral feasibility. Cost / benefit analysis.

system and procedures Analysis of alternative candidate systems Cost estimates	Is the problem worth solving? How can the problem be redefined?	System scope and objectives. Statement of new scope and objectives.
3. *Analysis* Detailed evaluation of present system Data collection	What must be done to solve the problem? What are the facts?	Logical model of system – e.g. data dictionary, data flow diagram. Pertinent data. suitable
4. *Design* General design specification Detailed design specifications Output Input Files Procedures	In general, how must the problem is solved? Specifically, how must the problem is solved? What is the system flow? Does the user approve the system?	Design of alternative solutions Find cost / benefit analysis Hardware specifications Cost estimates Implementation specifications Implementation schedule
5. *Implementation* User training File / system conversion	What is the actual operation? Are user manuals ready? Are there delays in loading files?	Training program. User – friendly documentation
6. *Post implementation and maintenance* Evaluation Maintenance Enhancements	Is the key system running? Should the system be modified?	User requirements met. User standards met. Satisfied user.

Q. Describe the impetus for system change.
Ans: motivation/ prerona

Sources of system analysis

Organization based | Environment based

Organization
Top management
User
Systems analysis

Impetus for change

Government rules and regulations
Consumers
Union
Competition

Recognition of need

Feasibility study

Analysis

Design

Implementation

Post implementation

Maintenance

Fig: *Major Sources of Change*

Environment based change: It refers to the idea for change originates in the environment or from within the firm. Environment – based ideas originate from customers, vendors, government sources and the like. For example, new unemployment compensation regulations may make it necessary to change the reporting procedure, format and content of various reports, as well as file structures. Customer complaints about the delivery of orders may prompt an investigation of the delivery schedule the experience of the truck drivers or the volume of orders to be delivered. When investigated, each of these ideas may lead to a problem definition as a first step in the system life cycle process.

Organization based change: It refers the ideas for change may also come from within the organization – top management, the user, the analyst. As an organization changes its operations or faces advances in computer technology, someone within the organization may feel the need to update existing applications or improve procedures. Here are some examples:

- An organization acquires another organization.
- A local bank branches into the suburbs.

Q. Write down the major questions that feasibility study focuses on.
Ans: Feasibility study focuses three major questions:

- What are the user's demonstrable needs and how does a candidate system meet them?
- What resources are available for given candidate systems? Is the problem worth solving?
- What is the likely impact of the candidate system on the organization? How well does it fit within the organization's master MIS plan?

Q. What are the content / element / topic in feasibility report?
Ans: Feasibility report consists of the following:

- ***Statement of the problem*** – a carefully worded statement of the problem that led to analysis.
- ***Summary of findings and recommendations*** – list of the major findings and recommendations of the study. It is ideal for the user who requires quick access to the results of the analysis of the system under study.
- ***Detail of findings*** – an outline of the methods and procedures under taken by the existing system followed by coverage of the objectives and procedures of the candidate system. Included are also discussions of output reports, files structures and costs and benefits of the candidate system.
- ***Recommendations and conclusions*** – specific recommendations regarding the candidate system, including personnel assignments, costs, project schedules and target dates.

Q. Explain feasibility study phase.
Ans: <u>Feasibility study:</u> Depending on the results of the initial investigation, the survey is expanded to a more detailed feasibility study. A feasibility study is a test of a system proposal according to its workability, impact on the organization, ability to meet user needs and effective use of resources. It focuses on three major questions:

- What are the user's demonstrable needs and how does a candidate system meet them?
- What resources are available for given candidate systems? Is the problem worth solving?
- What is the likely impact of the candidate system on the organization? How well does it fit within the organization's master MIS plan?

Each of these questions must be answered carefully. They revolve around investigation and evaluation of the problem, identification and description of candidate systems, specification of performance and the cost of each system and final selection of the best system.

The objective of a feasibility study is not to solve the problem but to acquire a sense of its scope. During the study the problem definition is crystallized and aspects of the problem to be included in the system are determined. Consequently, costs and benefits are estimated with greater accuracy at this stage.

The result of the feasibility study is a formal proposal. This is simply a report – a formal document detailing the nature and scope of the proposed solution. The proposal summarizes what is known and what is going to be done. It consists of the following:

- ***Statement of the problem*** – a carefully worded statement of the problem that led to analysis.
- ***Summary of findings and recommendations*** – list of the major findings and recommendations of the study. It is ideal for the user who requires quick access to the results of the analysis of the system under study.
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After the proposal is reviewed by management, it becomes a formal agreement that paves the way for actual design and implementation.

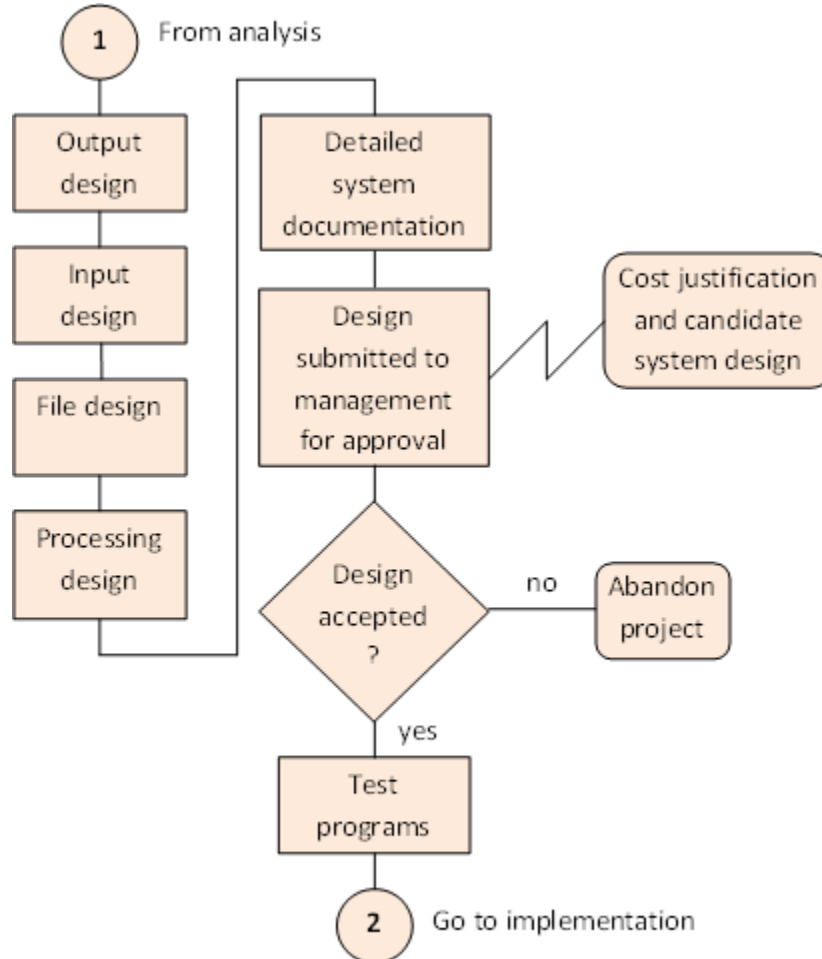**Q. Explain the design phase of SDLC.**
Ans:

Fig: *Steps in system design.*

The most creative and challenging phase of the system life cycle is system design. The term design describes a final system and the process by which it is developed. It refers to the technical specifications that will be applied in implementing the candidate system. It also includes the construction of programs and program testing. The key question here is:
"How should the problem be solved?"

- The first step is to determine how the output is to be produced and in what format?
- Second, input data and master files have to be designed to meet the requirements of the proposed output.
- Finally, details related to justification of the system and an estimate of the impact of the candidate system on the user and the organization are documented and evaluated by management as a step toward implementation.

Q. Explain implementation phase and post implementation and maintenance phase in SDLC.
Ans: Implementation: The implementation phase is less creative than system design. It is primarily

concerned with user training, site preparation and file conversion. When the candidate system is linked to terminals or remote sites, the telecommunication network and tests of the network along with the system are also included under implementation.

During the final testing, user acceptance is tested followed b user training. Depending on the nature of the system, extensive user training may be required.

Post – implementation and maintenance: After installation phase is completed and the user staff is adjusted to the changes created by the candidate system, evaluation and maintenance begin. Like any system there is an aging process that requires periodic maintenance of hardware and software. If the new information is inconsistent with the design specifications, then changes have to be made. Hardware also required periodic maintenance to keep in tune with design specifications. The importance of maintenance is to continue to bring the new system to standard.

Q. When does an analyst terminate a project?

Ans: A system project may be dropped at any time prior to implementation, although it becomes more difficult when it goes past the design phase. Generally, projects are dropped if after a review process, it is learned that:

- Changing objectives or requirements of the user cannot be met by the existing design.
- Benefits realized from the candidate system do not justify commitment to implementation.
- There is a sudden change in the user's budget or an increase in design costs beyond the estimate made during the feasibility study.
- The project greatly exceeds the time and cost schedule.

In each case, a system project may be terminated at the user's request.

Q. What are the reasons that a new system does not meet user requirements?

Ans: There are many reasons a new system does not meet user requirements:

- User requirements were not clearly defined or understood.
- The user was not directly involved in the crucial phases or system development.
- The analyst, programmer or both were inexperienced.
- The systems analyst had to do the work under stringent time consistent. Consequently, not enough through went into the feasibility study and system design.
- User training was poor.
- Existing hardware proved deficient to handle the new application.
- The new system left users in other departments out of touch with information that the old system had provided.
- The new system was not user friendly.
- Users changed their requirements.
- The users staff was hostile.

Q. What are the considerations / factors in deciding on a candidate system?

Ans: The considerations in deciding on a candidate system are: 2019 2c   2014 2b

- **Technical considerations:** Technical factor involves the system department's ability to handle a project. Much depends on the availability of qualified analysts, designers and software specialists to do the work.
- **Behavioral considerations:** The behavioral factor involves –
  o The user's past experience with an existing system.
  o The success record of the analyst and
  o The influence the user can exert on upper management to finance a candidate system.
- **Political considerations:** Political considerations that subjectively favor one project over another, the status of the department and its performance record are additional factors that bear on funding a candidate system.

- **Economic considerations:** The most important criterion in selecting a project is the economic factor. It focuses on the systems potential return on investment. What is considered an acceptable rate varies with different formulas, the variables chosen and the like. System consultants suggest an annual rate of return of just over 20 percent.

Q. Explain the levels of structuring work units in the system development. Or, describe phases, activities and tasks of a system project.

Ans: the levels of structuring work units are –

```
• Problem definition
• Feasibility study
   ⋮
• Evaluation
```

```
• Economic feasibility
• Organization feasibility
   ⋮
• Application feasibility
```

```
• Interview secretaries
• Summarize findings
• Prepare pie chart on results of data
  collected
• Compare company's goals to
  capabilities of candidate system
```

Fig: Phases, activities and tasks of a system project.

- **Tasks (lowest level):** At the lowest level work assignments are broken down into small manageable tasks. A task is usually a well defined, structured work unit that can e carried out by one individual. The task can be easily budgeted and scheduled and its quality measured.
- **Activities (2nd level):** The second level at which work units are structured involves activities that have a larger scope and are designed to produce substantial results. An activity is a group of logically related tasks that serve one phase of the system development life cycle.
- **Phases (3rd level):** A phase, a third level of control, is a set of activities that bring the project to a critical milestone. Milestones are steppingstones that make up the entire project.

Q. Explain planning and control for system success.

Ans: To ensure the success of a system,

- First, a plan must be devised, detailing the procedure, some methodology, activities, resources, costs and time table for completing the system.
- Second, in larger projects a project team must be formed of analyst, programmers a system, consultant and user representatives.
- Finally, the project should be divided into manageable modules to reflect the phases of system development, analysis, design and implementation.

Work units have to be structured at three major levels for effective control of the project.
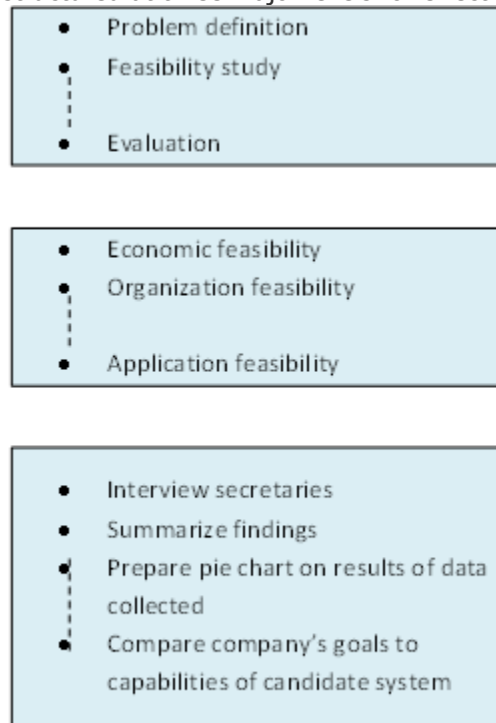

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In planning a project, the following steps should be taken:

- Identify the activities in each phase and the tasks within each activity.
- Calculate the budget for each phase and obtain agreement to proceed.
- Review, record and summarize progress on activities periodically.
- Prepare a project progress report at the end of a reporting month.

2019 2 d What is the concept of prototyping?   2014 2c
Q. What is prototyping? Why prototyping is needed to improve system analysis and design phase? Or, Explain SDLC with prototyping. Write the benefits of using prototype in SDLC.
Ans: Prototyping: Prototyping is an iterative process of system development in which there establishes a close work between analyst and users. It uses advanced computer technology. It builds system in trial and error method and refining it through an iterative process.

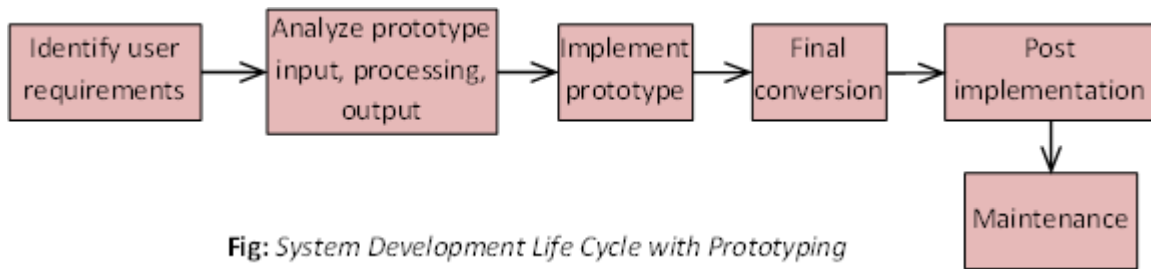2015 2b) What is prototyping? Write down basic steps of prototyping 2.75

Fig: *System Development Life Cycle with Prototyping*

The basic steps are:

- Identify the user's information and operating requirements.
- Develop a working prototype that focuses on only the most important functions, using a basic database.
- Allow the user to use the prototype, discuss requested changes and implement the most important change.
- Repeat the next version of the prototype with further changes incorporated until the system fully meets user requirements.

Prototyping and advanced system development techniques have been successful in a wide variety of applications. The benefit includes shorter development time, more accurate user requirements and greater user participation and support.

2014 2a
2019 2a) What do you mean by candidate system?

A candidate System is needed while designing a system.
It represents the original System to be made and analyzed by the analyst so that changes and improvements can be made in it on the basis of Feasibility studies.
And when the Candidate system approves all the requirements of the customer, The final system is made on the basis of this candidate system.