Software Engineering

T.E – B

Unit 2

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Q.1 Feasibility Analysis in SE.

- **Feasibility Study** in Software Engineering is a study to evaluate feasibility of proposed project or system.
- Feasibility study is one of stage among important four stages of Software Project Management Process.
- As name suggests feasibility study is the feasibility analysis or it is a measure of the software product in terms of how much beneficial product development will be for the organization in a practical point of view.
- Feasibility study is carried out based on many purposes to analyze whether software product will be right in terms of development, implantation, contribution of project to the organization etc.
- A feasibility study is part of the initial design stage of any proposed project/plan. It is carried out to evaluate the feasibility of a proposed project or existing software used by the business. It can assist in identifying and assessing the opportunities and threats present in the natural environment, the resources needed for the project, and the chances of success.

Types of Feasibility Study:
The feasibility study mainly concentrates on below five mentioned areas. Among this Economic Feasibility Study is most important part of the feasibility analysis and Legal Feasibility Study is less considered feasibility analysis.

- **Technical Feasibility –**
  In Technical Feasibility current resources both hardware software along with required technology are analyzed/assessed to develop project. This technical feasibility study gives report whether there exists correct required resources and technologies which will be used for project development. Along with this, feasibility study also analyzes technical skills and capabilities of technical team, existing technology can be used or not, maintenance and up-gradation is easy or not for chosen technology etc.
- **Operational Feasibility –**
  In Operational Feasibility degree of providing service to requirements is analyzed along with how much easy product will be to operate and maintenance after deployment. Along with this other operational scopes are determining usability of product, Determining suggested solution by software development team is acceptable or not etc.

- **Economic Feasibility –**
  In Economic Feasibility study cost and benefit of the project is analyzed. Means under this feasibility study a detail analysis is carried out what will be cost of the project for development which includes all required cost for final development like hardware and software resource required, design and development cost and operational cost and so on. After that it is analyzed whether project will be beneficial in terms of finance for organization or not.
- **Legal Feasibility –**
  In Legal Feasibility study project is analyzed in legality point of view. This includes analyzing barriers of legal implementation of project, data protection acts or social media laws, project certificate, license, copyright etc. Overall it can be said that Legal Feasibility Study is study to know if proposed project conform legal and ethical requirements.
- **Schedule Feasibility –**
  In Schedule Feasibility Study mainly timelines/deadlines is analyzed for proposed project which includes how many times teams will take to complete final project which has a great impact on the organization as purpose of project may fail if it can't be completed on time.

Aim of feasibility study:

- ✓ The overall objective of the organization are covered and contributed by the system or not.
- ✓ The implementation of the system be done using current technology or not.
- ✓ Can the system be integrated with the other system which are already exist

Need of Feasibility Study:

- Feasibility study is so important stage of Software Project Management Process as after completion of feasibility study it gives a conclusion of whether to go ahead with proposed project as it is practically feasible or to stop proposed project here as it is not right/feasible to develop or to think/analyze about proposed project again.
- Along with this Feasibility study helps in identifying risk factors involved in developing and deploying system and planning for risk analysis also narrows the business alternatives and enhance success rate analyzing different parameters associated with proposed project development.

Q.2 Cost Benefit analysis in SE.

Cost Benefit analysis is thing that everyone must do so as to think of a powerful or an efficient system. But while thinking out on cost and benefit analysis, we also need to find out factors that really affect benefits and costs of system. In developing cost estimates for a system, we need to consider some of cost elements. Some elements among them are hardware, personnel, facility, operating and supply cost. The following are the cost factors:

1. **Hardware cost –**
   Hardware cost includes actual purchase and peripherals (external devices) that are connected to computer. For example, printer, disk drives etc. Actually, finding actual cost of hardware is generally more difficult especially, when system is shared by various users so as to compared to a system which dedicated stand alone. In some case, best way is to treat it as operating cost.
2. **Personnel costs –**
   Personnel costs includes EDP staff salaries and benefits as well as pay for those who are involved in process of development of system. Cost occurred during development of system which are onetime costs and are also called development cost. Once system is installed, cost of operating and maintaining system becomes recurring cost that one has to pay very frequently based on requirement.
3. **Facility cost –**
   Facility cost is amount of money that is spent in preparation of a site that is physical where application or computer will be in operation. This includes wiring, flooring, lighting and air conditioning. These costs are treated as one- time costs and are included into overall cost estimate of candidate system.
4. **Operating costs –**
   These includes all costs associated with day-to-day (everyday) operation of system and amount depends on number of shifts, nature of applications. There are various ways of covering operating costs. One approach is to treat operating costs as an overhead. Another approach is to charge money from each authorized user for amount of processing they require from system. Amount charged is based on computer time or time they spend on system, staff time ad volume of output produced.
5. **Supply costs –**
   Supply cost are variable costs that increase with increased use of paper, disks and like. They should be estimated and included in overall cost of system.

A system is also expected to provide benefits. First task is to identify each benefit and then assign some value to it for purpose of cost/ benefit analysis. Benefits may be tangible and intangible, direct or indirect.

Two major benefits are improving performance and minimizing cost of processing of system. The performance category emphasizes improvement in accuracy of or access to information and easier access to system by authorized users. Minimizing costs through an efficient system – error control or reduction of staff- is a benefit that should be measured and included in cost/benefit analysis.
The determination of costs and benefit entails following steps:

1. Identify the costs and benefits pertaining to given project.
2. Categorize the various costs and benefits for analysis.
3. Select a method of evaluation.
4. Interpret the results of the analysis.
5. Take action.

Q.3 Requirement modeling and types.

- Requirements modeling are **the process used in software development projects where requirements and solutions constantly evolve through collaborative efforts and teamwork**. By using this method of cross-functional and self-organizing teams, you can ensure that your team meets the exact needs of the stakeholders.
- Major styles of requirement modeling currently in practice are as follows – scenario-based model, data or flow model, class model, and behavioral model.
- Scenario-based model - This model is prepared from an end-user perspective. Techniques such as use cases, user stories, and activity diagrams would be a major contributor to this model.
- Flow-based model – When a requirement deals with a specific data flow that affects various modules of a system, data-based modeling is the best method that can accommodate the system flow and the data flow within the system. This could be a tedious model but it is a helpful model to do impact analysis. Data Flow diagrams, activity diagrams are types of this model.
- Class-based model – Class diagrams are the most popular UML diagrams used for the construction of software applications. They are a graphical representation of the static view of the system and represent different aspects of the application. This involves identifying the classes such as the event occurrences, roles, places, structures, and other artifacts involved. Examples: Class diagrams.
- Behavioral model – A behavior model provides a way to show how different parts of the system interact with each other functionally to perform system tasks or functions. It's used to determine the steps from an initial state to a final state of the system. Mainly state diagram and sequence diagram builds up this model.

Module Takeaway:

1. **Define Feasibility analysis and state types.**
2. **Define Cost Benefit analysis and types.**
3. **What is requirement modeling? Explain types.**
4. **Draw a class diagram on Tourism application.**
5. **Draw a Use case diagram on Attendance management system.**