**SPM tutorial Chapter 4**

**Selection of Appropriate Project Approach**

1. **How will you categorize each of following systems**

a. A payroll system

Payroll system will come under a **data oriented system**. The payroll of the employees are calculated using the employee’s data like position (manager, SWE I, SWE II, ..), Years working in the company, contributions etc. These are stored in the database of the software and retrieved later for further analysis.

b. System to control a car manufacturing industry

**Control Oriented System.** Car manufacturing equipment uses embedded systems.

c. A software package to support project managers

**Data Oriented System.** Project managers collect data about activities and describe it and have analysis info about it, these are stored in databases and presented.

d. A system used by lawyers to access case law relating to company taxation

**Data Oriented System.** Company taxation data is collected and presented for lawyers to analyze them.

e. An embedded software to control the lift(elevator)

**Control Oriented System.** Lift sensors which use machines use embedded systems.

f. A software to control the pace maker (health monitoring device)

**Control Oriented System.** Pacemakers use embedded systems for sensory analysis.

**2. Define Process**

Process is emphasizing the idea of the system in action. The requirements of the system are taken down in the requirements documentation and the idea to carry out to build the system with respect to the requirements is essentially the execution of ‘process’.

**3. What is a process model?**

A process model or software process model describes the Software Development Life Cycle step by step. In each phase of the SDLC, the pre-requisites and the output of every stage is clearly shown.

There are several process models for the project management team to pick up depending on the project of undertaking. Some of the popular process models are waterfall model, v-process model and the spiral model.

**4. Difference between prototype and process model.**

A prototype/ software prototype is a projection of the final product that will be developed by the team at the time of the project completion, a prototype will have core working functionalities of the software without other auxiliary components that will be needed for the wide deployment for the customers/clients to use. Prototypes are classified into throw-away prototypes, evolutionary prototypes and incremental prototypes.

A process model describes the creation of the software product at different stages of the SDLC.

It has clear requirements about the pre-requisites, outputs of each and every phase as described by the preferred process model. Prototype may be obtained in a particular stage of the process model, as the process model essentially describes the mechanism of the creation of the product.

**5. What are the various process models?**

1. Waterfall model
2. V process model
3. Spiral model

**6. How will you select a process model for the given system specification?**

**7. List one advantage and disadvantage of each process model.**

Waterfall model

Advantage: Each preceding step serves an approved, documented baseline for the succeeding step.

Disadvantage: No demonstration of system capabilities can occur until the end of the project.

V process model

Advantage: Testing activities like planning, test designing happens well before coding.

This saves a lot of time.

Disadvantage: Defects cause a loop back to the corresponding development stage and a reworking of the succeeding steps.

Spiral model

Advantage: Greater level of detail are considered at each stage of the project

Hence greater degree of confidence about the success of the project

Disadvantage: It is not suitable for small projects as it is expensive. It is much more complex than other SDLC models.

**8. What are three types of prototypes?**

1. Throw-away prototypes
2. Incremental prototypes
3. Evolutionary prototypes

**9. List advantages and disadvantages of prototypes.**

Advantages

Learning by doing.

Improved communication and user involvement.

Reduced need for documentation.

Reduced maintenance costs.

Production of expected Results.

Disadvantages

Lack of control and project standards.

Additional expense.

Close proximity of developers.

**10. What is incremental delivery?**

It is breaking the system down into small components which are implemented and delivered in sequence.First, a simple working system implementing only a few basic features is built and then that is delivered to the customer. Then thereafter many successive iterations/ versions are implemented and delivered to the customer until the desired system is released.

**11. Advantages of incremental delivery**

Advantages:

Feedback from early stages can influence later stages.

Earlier delivery improves cash flow, because you get some return on investment early on.

Smaller sub-projects are easier to control and manage.

‘Gold Plating’, the requesting of features that are unnecessary should be less as users will know that they get more than one opportunity to make their requirements known.

**12. A software package is to be designed and built to assist in software cost estimation. It will input certain parameters and produce initial cost estimates to be used at bidding time. Design how a prototype could be prepared for above software.**

The prototype of the mentioned software can be prepared by implementing the core functionality of the software such as producing the initial cost estimate. The prototype can have the cost estimation algorithms formed by previously held auctions’ data and how the input parameters could vary from auction to auction. I would suggest this to be an evolutionary prototype as it can very well turn into an operational software later on.

**13. A Library information system has following transactions : Add Members, Delete Members, Modify members, Print Member list, Add books, Delete Books, Modify books, Print list of books, Book issue, Book Return, Fine calculation, List of books available, List of books taken by a particular member.**

**List the priority of transactions which has to be developed and delivered first which will be a value addition to the customer.**

1. Add Books
2. Add Members
3. Print List of Books
4. Book issue
5. Book Return
6. Print member list
7. List of books taken by particular member
8. Modify members
9. Modify books
10. Delete members
11. Delete books
12. Fine calculation