

SDLC

SDLC Life Cycle – As mentioned in PCC Study Material – One additional step (ie the 7th) - Steps are – Preliminary Investigation, System analysis, System Design, System Acquisition, System Design, System Implementation and Maintenance, **Post Implementation Evaluation (New)**.

Approaches to Sys Development – Traditional Approach – When one task is over, next one are undertaken. It is just like arranging the above steps in a top down manner.

SD Methodology – a) Project is divided into identifiable process b) Specific reports, documents called deliverables are produced c) Users, managers, auditors etc to be involved in SD d) Testing it thoroughly e) Training Plan is developed as to who will operate etc f) Formal Program Change Controls are developed to avoid unauthorized changes and g) Post Implementation review

Normally in large organizations a Steering Committee consisting of ARE Service users deciding whether a system needs to be developed. The decisions regarding the methodology, requirements etc are determined by this committee.

STAGE I – PRELIMINARY INVESTIGATION – Purpose is to evaluate the project request. Identifying merits of the project are assessed. Investigation is conducted by **reviewing internal documents and conducting interviews**. Viable options are identified. Then the project's feasibility is evaluated. **Technical, Economic, Operational**, Schedule, Legal Feasibility etc are evaluated.

STAGE II – REQUIREMENT ANALYSIS – As the name suggests the requirements from the users are identified. For this various facts are ascertained – Fact Finding Techniques – **Documents, Questionnaires, Interviews, Observation**.

The next step is to Analyze the Present System – a) Review historical aspects by review of annual reports, system changes in the past etc. b) Analyze the inputs c) Review the data files maintained noting their size, number etc d) Review the methods, procedures and data communications to identify unnecessary tasks e) Analyze the outputs f) Review the Internal Controls g) Model the existing physical and logical System (i.e. the process is to be documented properly by using flow charts etc) h) Undertake an overall analysis of the present system by analyzing the present work volume, personnel requirements and benefits and costs.

System Development Tools –

- a) System Component and Flows – Documents flow of the data among major resources of an info sys. A data flow diagram uses few symbols to illustrate flow of data among external entities such as people or organization.
- b) User Interface – part with which user interacts. Layout forms, screens etc are used to construct the formats and contents of input / output media.
- c) Data attributes and relationships – Data dictionary (As learnt in PCC) is used. Entity Relationships are used to document number and type of relationship among entities in a system

d) Detailed System Process – Help programmer to develop detailed procedures and processes.

Some of the tools for d) above are System Flow Charts, Data Flow Diagram, Layout Forms and Screens, System components matrix, CASE Tools, Data Dictionary

CASE Tools – Computer Aided System Engineering – Automation of anything wat humans do. Can be used to create complete and internally consistent requirements specifications with graphic generators and specification languages.

STAGE III – SYSTEM DESIGN – Design Outputs, Inputs, Forms. Codes etc

Factors in designing output are – Content, Form, Output Volume, Timeliness, Media, Format

Designing visual display output – Layout of display screen – Physical Dimension of screen, Number of rows and columns, Degree of resolution (High, Medium, Low), Number of colors available (monochrome, 3 colors, 8 colors etc), Methods of highlighting (underline, bold, blinking) Methods of intensity control (high/low, normal, inverse)

Designing inputs – Content, Timeliness, Media, Format, Input Volume

Designing Forms – Form flow, Divide forms into logical sections, Captioning, Meeting the intended purpose, Ensure accurate completion and keeping the forms attractive.

Coding Methods – Individuality, Space, Convenience, Expandability, Suggestiveness, Permanence

Requirements of Data Communication System – System analyst must select the following components - For communication channels - channel selection, transmission rate, type of line etc and regarding communication control devices – modems, data service units, multiplexer, data switches, type of network etc.

System Manual – Description of tasks to be performed complete with layouts and flowcharts. Contains – a) General Desc of the existing system b) flow of existing system c) Outputs of the existing system, d) general desc of new system e) Flow of new system f) Output layouts distribution etc.

STAGE IV - SYS ACQUISITION AND SOFTWARE DEVELOPMENT

Software can be Made or Bought. Advantages of application packages are rapid implementation, low risk, increased quality and low cost.

Steps in selection of a computer system – Prepare the design specifications, Prepare and distribute an Request for Proposal (RFP), On the basis of an analysis eliminate vendors with inferior proposals, Have vendors present their proposals, conduct further analysis of the proposals, contact present users of the proposed system, conduct equipment benchmark test, Select the equipment

Methods of validating the proposal

- a) Checklist – Two types – Software Validation and Support Service
- b) Point Scoring Analysis – Evaluation committee assigns points based on relative importance – Sum up the points – Determines the proposal to be selected
- c) Public Evaluation Reports – Several consultancy agencies compare and contrast the hardware and software performance in the form of reports.

SOFTWARE DEVELOPMENT –

- a) Program analysis
- b) Program design
- c) Program coding
- d) Debug the program - Tedious task. Structured walkthroughs are used which means mental execution of the program before its run to catch errors beforehand. The program is tested and checked for adherence to standards.
- e) Program documentation
- f) Program maintenance

ALTERNATE DEVELOPMENT METHODOLOGIES

- a) Prototyping approach – A model program is developed in parts. Changes are incorporated. Finally the prototype is either selected or discarded
Advantages – better definition of user needs, short time period required, errors are detected and eliminated early
Disadv – requires users to spend extensive time which may not be feasible always, prototype requires frequent testing which forces to minimize tests, causes behavioral problems with the system users.
- b) End user Development – Manager or department acquires its own system. Disadv are decline in standards and controls, specification requirements, assurance and stability of the system, increase in unrelated and incompatible systems and difficulties in accessing could arise.
- c) Systematic Approach in small org – Simple steps in small org – They identify their requirements, locate evaluate and secure suitable software and hardware and implement the system.
- d) Rapid Application Development – RAD – Principle is satisfying 80% of requirement by concentrating on 20% of key requirements. Applications are developed rapidly by RAD teams

STAGE V –SYSTEM TESTING

STAGE VI – SYS IMPLEMENTATION – Main steps are **a) Equipment Installation which consist of Site Preparation, Equipment Installation and Check out b) Training personnel namely system operators and user training c) Conversion procedures**

Activities involved in a conversion are – **Procedure, File, System Conversions, Scheduling personnel and equipment and Alternative plans in case of equipment failure.**

STAGE VII - POST IMPLEMENTATION EVALUATION comprising of Operation, Development and Information evaluation.

SYS MAINTENANCE – 5 types – **Scheduled, Rescue, Perfective, Corrective and Adaptive Maintenance**