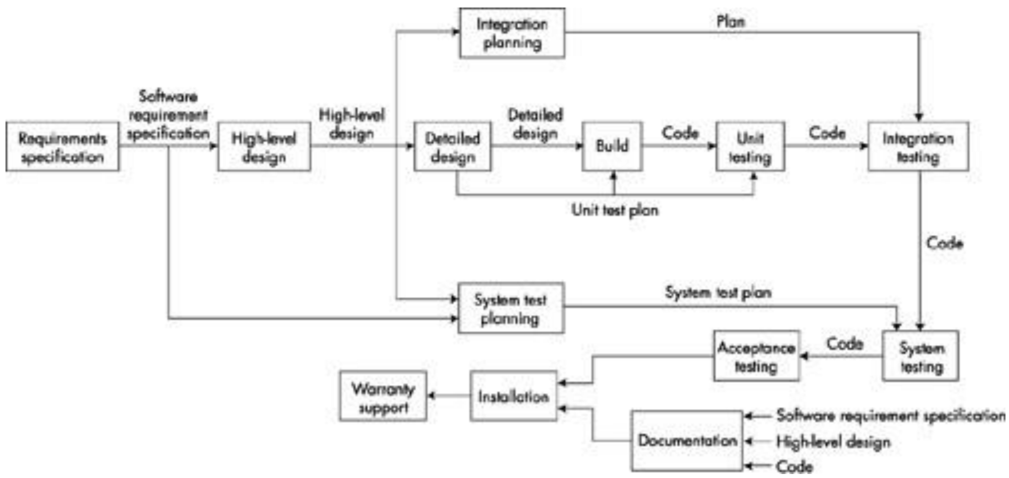
Unit IV

Q1.Explain Infosys development process .



The standard development process used at Infosys resembles the waterfall model, although the traditional phases have been broken into smaller phases, or stages, to allow parallel execution of some phases.

The formal description of this process specifies the entry and exit criteria, inputs and outputs, participants, activities, and other information for each phase (stage). The process descriptions are generally brief, specifying the list of activities to be undertaken in that phase.

This overall process remains the same even for a project using an object-oriented approach, although some of the phases are done differently in such a project. The difference lies mostly in the analysis and design phases, although the guidelines and standards for some of the later phases are also different.

This basic process is also used by projects that do iterative development or prototyping or perform only some stages of the life cycle. In these situations this standard process is adjusted to suit the project.

b) List and explain contents of PDBC process data bases. Give sample entry.

To use the information in the PDB during planning, project managers often find information about similar projects particularly useful. To allow for similarity checking, you should capture in the PDB general information about the project, such as languages used, platforms, databases used, tools used, size, and effort. With this type of information, a project manager can search and find information on all projects that, for example, focused on a particular application domain, used a particular database management system (DBMS) or language, or targeted a specific platform.

To help in project planning, you should capture data about the effort, defects, schedule, risk, and so on. If the total effort spent in a project is known, along with the size and distribution of effort in different phases, this data can be used for estimating effort in a new project.

Thus, the data captured in the PDB at Infosys can be classified as follows:

Project characteristics

Project schedule

Project effort

Size

Defects

Sample entry

Table 2.1. General Data about a Project

General Characteristics	
Field Name	Value for Synergy
ProcessCategory	Development
LifeCycle	Full
BusinessDomain	Brokerage/Finance
ProcessTailoringNotes	Added group review for high-impact documents. First program of each developer was group reviewed.
PeakTeamSize	12
ToolsUsed	VSS for document CM, VAJ for source code
EstimatedStart	20 Jan 2000
EstimatedFinish	5 May 2000

Q 3.What do you mean by Process capability baseline?

Whereas the PDB contains data for each project, the process capability baseline represents a snapshot of the capability of the process at some point in time in quantitative terms. The capability of a process is essentially the range of outcomes that can be expected by a project if the process is followed.[5] The capability of a stable process can be determined from past performance of the process. If baselines are regularly established, trends in the process capability can easily be obtained a key reason for having a PCB.

The PCB at Infosys contains the process performance stated primarily in terms of productivity, quality, schedule, and effort and defect distributions. It specifies the following:

Delivered quality
Productivity
Schedule
Effort distribution
Defect injection rate
In-process defect removal efficiency
Cost of quality
Defect distribution

Table 2.5. Process Capability Baseline for Development Process

Sequence Number	Parameter	Remarks	General Baseline, Development Projects
1	Delivered Quality	Delivered Defects /FP (Delivered Defects = Acceptance Defects + Warranty Defects)	0.00 0.094 Delivered Defects/FP (avg: 0.021)
		Quality expressed in terms of effort	0.00 0.012 Delivered Defects/Person-hour (avg: 0.003)
2	Productivity	For Third-Generation Languages	4 31 FP/person-month (avg: 12)
		For Fourth-Generation Languages	10 129 FP/person-month (avg: 50)
3	Schedule Adherence		81% of projects delivered within 10% of the agreed schedule
4	Effort		
4.1	Build Effort	Build effort for a medium program	Min Mean Max 2 4 6 person days
4.2	Effort Distribution		Min Mean Max
		Req. Analysis + Design	1 15 29%

Q 4.Short notes on

1. The Change Management Process

During project planning, a project manager decides which process is to be followed for handling change requests. The planned process is discussed with the customer so that both the customer and the vendor are in agreement about how to manage changes. Generally, the process specifies how the change requests will be made, when formal approvals are needed, and so on. When a request for a requirements change comes in, the requirements change management process must be executed.

Because change requests have cost implications, it is necessary to have a clear agreement on payment. Frequently, with customer approval, projects build a buffer into their estimates for implementing change requests (typically a small percentage of the total project effort). Such a budget provision simplifies the administrative aspects of implementing approved change requests.

The commonly used change management process at Infosys has the following steps.

1. Log the changes.
2. Perform an impact analysis on the work products.
3. Estimate the effort needed for the change requests.
4. Reestimate the delivery schedule.
5. Perform a cumulative cost impact analysis.
6. Review the impact with senior management if thresholds are exceeded.
7. Obtain customer sign-off.
8. Rework work products.

2. Risk Management

The purpose of the risk assessment task is to identify the risks, analyze them, and then prioritize them.

In prioritizing risks, you identify the risks that should be managed. In other words, prioritization determines where the extra effort of risk management should be spent to get the maximum benefit.

For this effort, two factors are important. First is the chance of a risk occurring; a more likely risk is a natural candidate for risk management. Second is the effect of the risk; a risk whose impact is very high is also a likely candidate.(Refer written notes).

Once the risks have been prioritized, you must decide what to do about them. Which ones will be managed is a management decision. Perhaps only the top few need to be handled in a project.

One approach is to take preventive or avoidance actions so that the perceived risk ceases to be a risk. For example, if new hardware is a risk, it could be avoided by implementing the project with proven hardware

3. Configuration Management

The CM process defines the sequence of activities that must be performed in support of the CM mechanisms. As with most activities in project management, the first stage in the CM process at Infosys is planning identifying those items that need to be under CM (known as configuration items), locations to store them, procedures for change control, and so on.

i. Planning and Setting Up Configuration Management

Planning for configuration management involves identifying the configuration items and specifying the procedures to be used for controlling and implementing changes to them. Identifying configuration items is a fundamental activity in any type of CM.[2,3,4] Typical examples of configuration items include requirements specifications, design documents, source code, test plans, test scripts, test procedures, test data

Identify configuration items, including customer-supplied and purchased items.
Define a naming and numbering scheme for the configuration items.
Define the directory structure needed for CM.
Define access restrictions.
Define change control procedures.
Identify and define the responsibility and authority of the CC or Configuration Control Board (CCB).
Define a method for tracking the status of configuration items.
Define a backup procedure.
Define a reconciliation procedure, if needed.
Define a release procedure.
Define an archival procedure.
Identify points at which the configuration items will be moved to the baseline.

ii. Perform Configuration Control

Two main configuration control activities are performed: one that deals with managing the state transitions of programs (and documents), and one that deals with managing the change requests that must be implemented.

State transition management involves moving the items from one directory to another when the state changes and then creating versions when changes are made.

Frequently, tools are used to manage the states and versions of items and access to them. Many CM tools employ the check-in/check-out procedure for controlling access and handling version control.

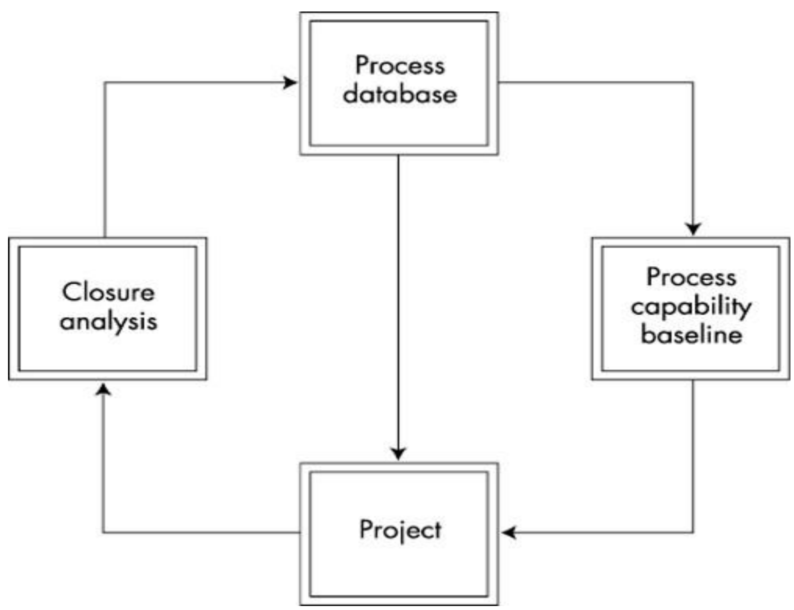
iii. Status Monitoring and Audits

A configuration item can exist in one of several states. The set of possible states varies according to whether the item is a program or a document and the type of CM tools being used. It is important to accurately represent the state of each item because state-related mistakes can lead to problems. For example, if a program has not been unit tested but is moved to the state "ready for release,"

5.Project Closure Analysis

Project closure analysis is the key to learning from the past so as to provide future improvements. To achieve this goal, it must be done carefully in an atmosphere of safety so that lessons can be captured and used to improve the process and future projects.

The objective of a postmortem or closure analysis is "to determine what went right, what went wrong, what worked, what did not, and how it could be made better the next time.Relevant information must be collected from the project, primarily for use by future projects.



Performing Closure Analysis

At Infosys, the project manager carries out the closure analysis with help from the SEPG quality adviser associated with the project. A template for the analysis report has been defined. The person carrying out the closure analysis must fill out this template properly, using mostly the metrics data, thereby keeping the focus on objective information.

the effort data are available from the weekly activity report database. The defect data can be gathered from the defect control system. Size data are obtained from the project. Planning data appear in the project management plan. These data constitute the main information needed for metrics analysis.

Closure Analysis Report

General and Process-Related Information

The closure report first gives general information about the project, the overall productivity achieved and quality delivered, the process used and process deviations, the estimated and actual start and end dates, the tools used, and so on. This section might also include a brief description of the project's experience with tools

Risk Management

The risk management section gives the risks initially anticipated for the project along with the risk mitigation steps planned. In addition, this section lists the top risks as viewed in the post-project analysis

Size

many projects use the bottom-up method for estimation. In this method, the size of the software is estimated in terms of the number of simple, medium, or complex modules.

Effort

The closure analysis report also contains the total estimated effort and the actual effort in person-hours. The total estimated effort is obtained from the project management plan. The total actual effort is the sum of the total effort reported in all WARs submitted by the project members, including the project leader. If the deviation between the actual and the estimated values is large, reasons for this variation are recorded.

Defects

The defects section of the closure analysis report contains a summary of the defects found during the project. The defects can be analyzed with respect to severity

Causal Analysis

When the project is finished, the performance of the overall process on this project is known. If the performance is outside the range given in the capability baseline, there is a good chance that the variability has an assignable cause. Causal analysis involves looking at large variations and then identifying their causes, generally through discussion and brainstorming.

Process Assets

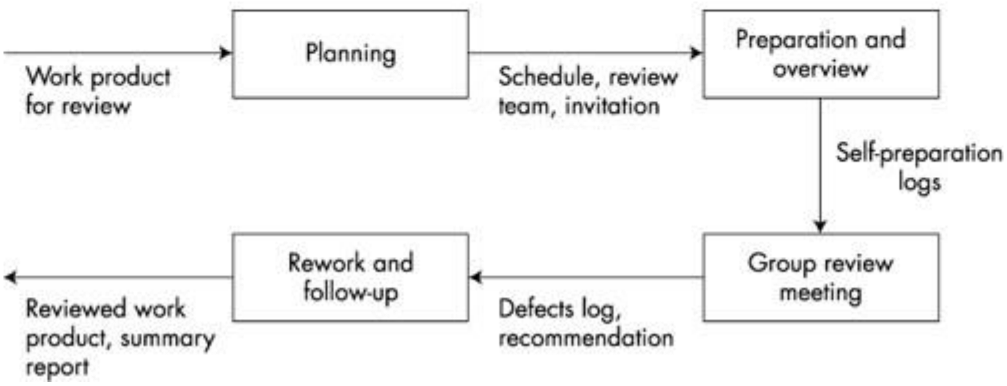
In addition to the metrics data, other project artifacts are potentially useful for future projects.

Q.Explain review process

The basic review process at Infosys is the group review, which is similar to an inspection. A group review is an analysis of a software work product by a group of peers following a clearly defined process. The goals of such reviews are to improve quality by finding defects and to improve productivity by finding defects in a cost-effective manner. In addition, reviews provide inputs and visibility for project management into the quality of the work products. A group review is conducted by technical people for technical people, and the focus is on identifying problems, not resolving them.

The group review process includes several stages: planning, preparation and overview, a group review meeting, and rework and follow-up.

Figure 10.1. The group review process



Planning

The objective of the planning phase is to prepare for the group review by selecting the group review team and scheduling the review. The author of the work product ensures that the work product is ready for group review and that all pertinent standards have been met.

Overview and Preparation

The purpose of the overview and preparation phase is to deliver the package for review to the reviewers and to explain the work product, if necessary. The material can be distributed and explained in an initial meeting.

Group Review Meeting

The basic purpose of the group review meeting is to come up with the final defect list; this list is based on the initial list of defects and issues reported by the reviewers and any new ones found during the meeting discussion.

Rework and Follow-up

The author performs rework to correct all defects raised during the group review meeting. The author may also have to redo the work product if the moderator recommends it. In addition, if the reviewers have been assigned open issues, they must investigate those problems and give the investigation results to the author and the moderator.

Q.Write a short note on defect tracking

It is the process of tracking the logged defects in a product from beginning to closure (by inspection, testing, or recording feedback from customers), and making new versions of the product that fix the defects.

Defect tracking is important in software engineering as complex software systems typically have tens or hundreds or thousands of defects: managing, evaluating and prioritizing these defects is a difficult task.

When the numbers of defects gets quite large, and the defects need to be tracked over extended periods of time, use of a defect tracking system can make the management task much easier.

Defect prevention aims to learn from defects found so far on the project and to prevent defects in the rest of the project.

Performing Pareto Analysis

A common statistical technique used for analyzing causes, Pareto analysis is one of the primary tools for quality management.[7,8] It is also sometimes called the 80-20 rule: 80% of the problems come from 20% of the possible sources. In software it can mean that 80% of the defects stem from 20% of the root causes or that 80% of the defects are found in 20% of the code.

The first step in defect prevention is to draw a Pareto chart from the defect data. The number of defects found of different types is computed from the defect data and is plotted as a bar chart in decreasing order. Along with the bar chart, another chart is plotted on the same graph showing the cumulative number of defects as we move from types of defects on the left of the x-axis to the right of the x-axis. The Pareto chart makes it immediately clear in visual as well as quantitative terms which are the main types of defects, and also which types of defects together form 80% 85% of the total defects. Instead of plotting the number of defects, you can plot a weighted sum by assigning different weights to different types of defects.

Q.Process Monitoring

To gain the benefits of plans and processes, projects must follow them properly. People can make mistakes, and under deadline pressures they tend to take shortcuts or expedient measures, often failing to follow processes correctly. To ensure compliance with the defined processes, an active effort is needed. Audits aim to fulfill this need.

The basic objective of audits is to ensure compliance with the defined process and to provide senior management with visibility into the use of processes. To ensure a reasonable degree of compliance, audits must be done regularly. They also must be formal, with a formal notice of noncompliance being issued and later tracked to satisfactory closure. Formality ensures that "personal equations" do not play a major role and that senior management gains visibility into process compliance through summary audit reports.

Conducting the Audit

In the audit, the auditors focus on whether the defined process is being followed in the project, paying greatest attention to the processes in the audit's focus area. They ask questions about how an activity is done, and they look at the evidence or outputs of these activities. They may use audit checklists to determine the questions. These checklists are derived from the approved processes and past experience, and they try to maximize the returns from an audit by concentrating on the key aspects rather than less important or peripheral issues. Here are parts of the checklist for project planning:

Is the project plan documented in the standard project plan template?

Has the project plan been group reviewed?

Has the project plan been approved and baselined, and is it under configuration management?

Is there a signed contract?

Have the commitments to the customer or other groups been reviewed?

Is there an estimated effort for the project that is based on historical data?

Have the effort estimates and the schedule been reviewed?

Is the quality plan complete, and has it been reviewed?

Is the life cycle used in the project identified and documented?

Q.Customer communication

Team communication is geared toward keeping the team informed and motivated.

Many problems are the result of misunderstandings between the customer and the developers. Regular communication between the development team and the customer can help avoid these kinds of problems.

Project managers should plan other means of communication, including weekly teleconferencing or videoconferencing and regular e-mails.

In a weekly virtual meeting, the project leader walks through the status report with the customer and explains the project constraints.

A key point of discussion is resolution of pending issues. The customer, on the other hand, seeks clarifications and explains her perspective in these meetings.

Overall, through regular communication that goes beyond sending reports, both the customer and the development team remain in sync. This prevents many potential problems rooted in misunderstandings.

Q.Quality Management Planning

Setting the Quality Goal

Project managers at Infosys set quality goals during the planning stages. The quality goal for a project generally is the expected number of defects found during acceptance testing. You can set the quality goal according to what is computed using past data; in this case, it is implied that you will use the standard process, and hence standard quality results will be expected. Two primary sources can be used for setting the quality goal: past data from similar projects and data from the PCB.

If you use data from similar projects, you can estimate the number of defects found during acceptance testing of the current project as the product of the number of defects found during acceptance testing of the similar projects and the ratio of the estimated effort for this project and the total effort of the similar projects.

The following sequence of steps is used:

1. Set the quality goal in terms of defects per FP.
2. Estimate the expected productivity level for the project.
3. Estimate the size in FP as (expected productivity * estimated effort).
4. Estimate the number of AT defects as (quality goal * estimated size).

Estimating Defects for Other Stages

Once the project's quality goal is set, you should estimate defect levels for the various quality control activities so that you can quantitatively control the quality.

Quality Process Planning

You can set a quality goal that is higher (or lower) than the quality level of a similar project, or you can aim for the levels achieved by the standard process. You can then determine the expected number of defects for the higher goal by using the quality goal set for the project.