

## **Software Project Management**

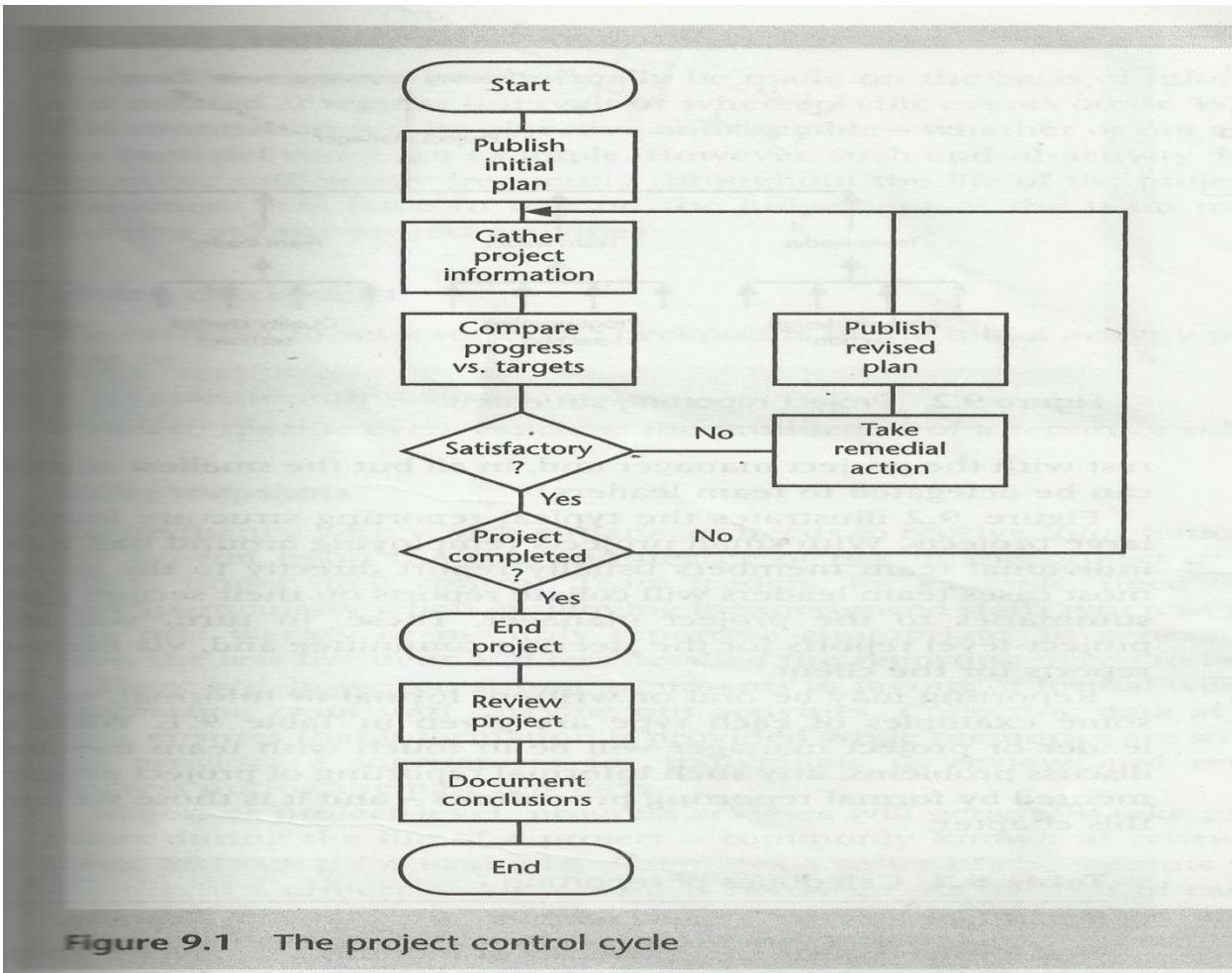
### **Unit 4 Notes**

#### Monitoring and Control

- Monitoring helps
  - To ensure the targets
  - To control the project
  - To find out what is happening and compare it with current targets

#### Project control

- It is a continual process of monitoring progress against the plan and where necessary ,revising the plan to take account of deviations.
- It helps to record the experience gained in the projects which can be used in the planning stages of future projects,
  - thus allowing to avoid the past mistakes



Deviation of plan

- Due to
  - Delays in meeting target dates
  - Shortfalls in quality
  - Inadequate functionality
  - Costs going over target

who is responsible?

- To ensure satisfactory progress on a project is often the role of project steering committee or Project Board

## Chapter 9 Monitoring and control

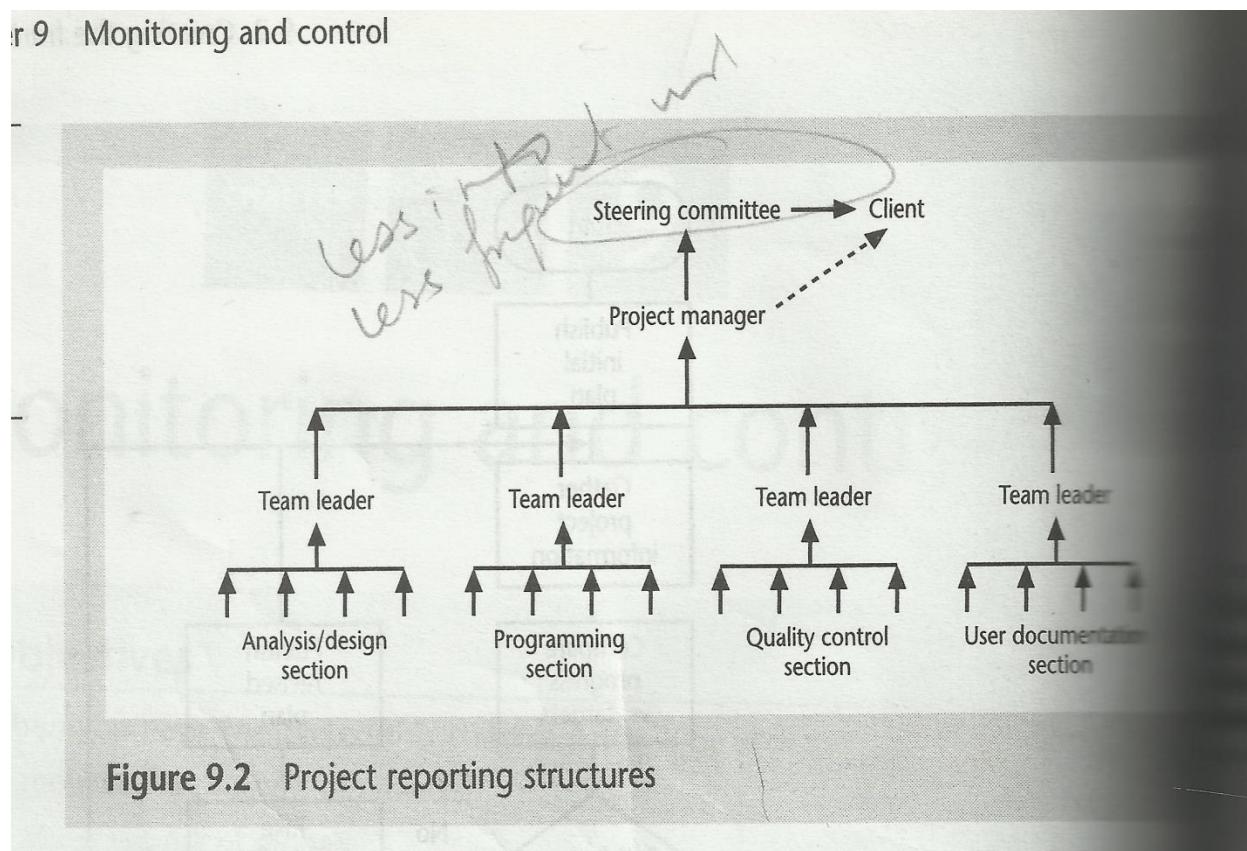


Figure 9.2 Project reporting structures

### Categories of reporting

this chapter.

**Table 9.1** Categories of reporting

Report type	Examples	Comment
Oral formal regular	Weekly or monthly progress meetings	While reports may be oral, formal written minutes should be kept
Oral formal <i>ad hoc</i>	End-of-stage review meetings	While largely oral, likely to receive and generate written reports
Written formal regular	Job sheets, progress reports	Normally weekly using forms
Written formal <i>ad hoc</i>	Exception reports, change reports	
Oral informal <i>ad hoc</i>	Canteen discussion, social interaction	Often provides early warning; must be backed up by formal reporting

## Progress Assessment

- Information can measure the project's objectives in determining whether the project can produce deliverable or not.
- It is based on
  - Information collected at regular intervals
  - Information collected when specific events occur.
  - Judgment of team members who are carrying out the project activities

## Setting Checkpoints or review points or control point

- It is essential to set a series of checkpoints in the initial activity plan
- It could be
  - Regular (monthly or weekly)
  - Tied to specific events such as production of a report or other deliverable.

## Taking snapshots

- The frequency with which a manager needs to receive information about progress depends on

Size and degree of risk of the project

Or the part the project under their control

- Team Leader –Assess progress daily
- Project Manager –weekly or monthly
- Higher the level, less detailed the reporting needs to be.
- Weekly collection of information
- PRINCE 2 tool – review point

## Collecting the Data

- Gather the information about partially completed activities and forecast how much work is left to be completed.
- Partial completion reporting

- Risk Reporting

### Partial Completion Reporting

- Many organization use standard accounting system with weekly time sheets to change the staff time to individual jobs.
- Weekly time sheets are prepared with rechargeable and non rechargeable hours.

<b>Time Sheet</b>						
Staff	John Smith			Week ending	30/3/07	
<b>Rechargeable hours</b>						
Project	Activity code	Description	Hours this week	% complete	Scheduled completion	Estimated completion
P21	A243	Code mod A3	12	30	24/4/07	24/4/07
P34	B771	Document take-on	20	90	6/4/07	4/4/07
Total recharged hours			32			
<b>Non-rechargeable hours</b>						
Code	Description		Hours this week	Comment and authorization		
Z99	Day in lieu		8	Authorized by RB		
Total non-rechargeable hours			8			

### Traffic light method

- Identify the key (first level) elements for assessment in a piece of work.
- Break the key elements into constituent elements (second level)
- Assess the second level elements
  - Green for “on target”

- Amber for “not on target but recoverable”
- Red for “not on target and recoverable only with difficulty”
- Review the second level assessments to arrive first level assessments  
Review first and second level assessments to produce an overall assessment

**Activity Assessment Sheet**

Staff Justin

Ref: IoE/P/13	Activity: Code and test module C						
Week number	13	14	15	16	17	18	
Activity summary	G	A	A	R			
Component							Comments
Screen handling procedures	G	A	A	G			
File update procedures	G	G	R	A			
Housekeeping procedures	G	G	G	A			
Compilation	G	G	G	R			
Test data runs	G	G	G	A			
Program documentation	G	G	A	R			

**figure 9.4 A traffic-light assessment of IoE/P/13**

- All the activity reports are submitted to the project manager and helps to identify the status of the project.
- It is not an estimate work done or to quantify expected delays.
- It highlights only the risk of non achievement

Visualizing progress

- All the data's are collected

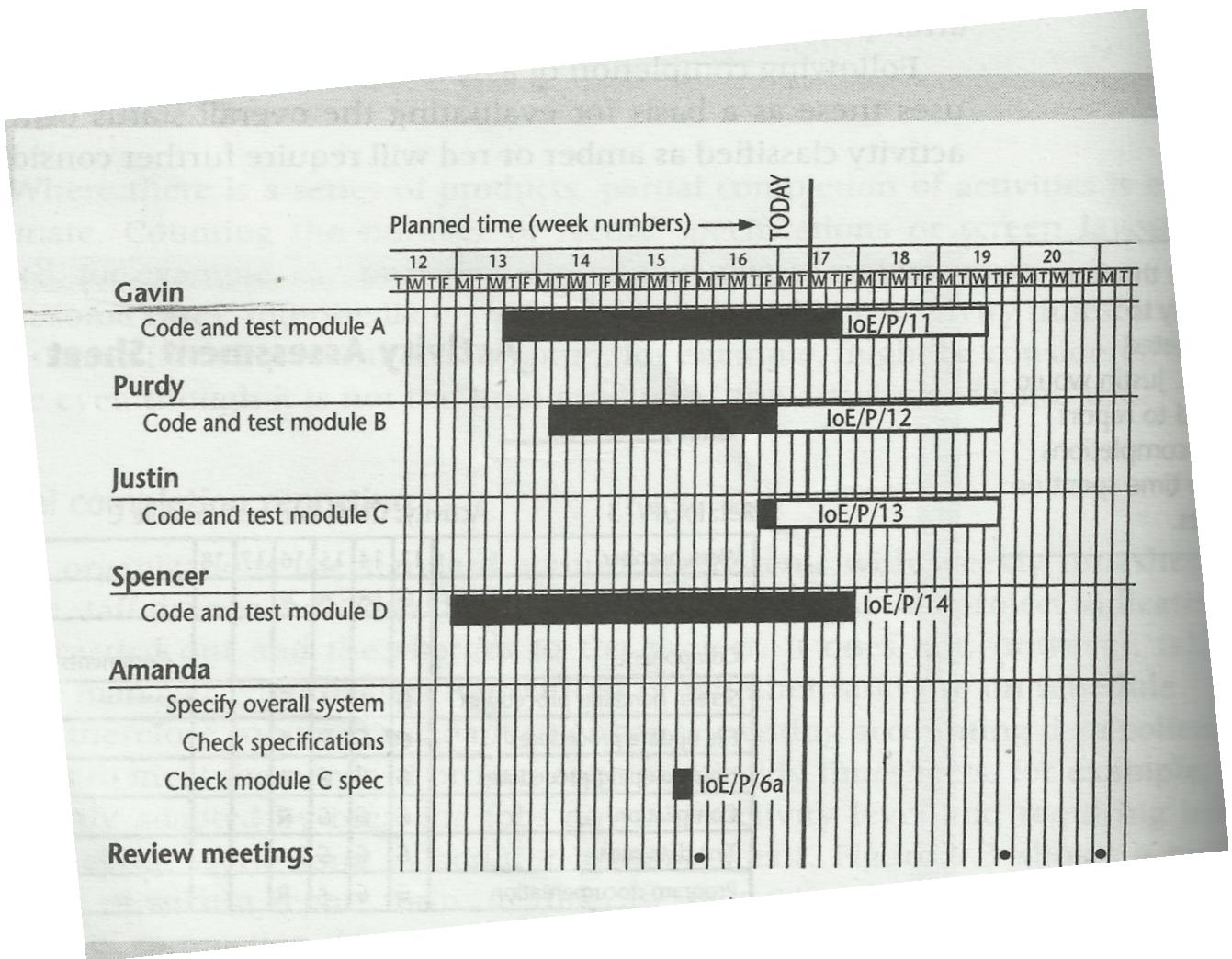
- A manager needs someway of presenting that data to greatest effect.

Methods to Present the picture of the project and its future

- Gantt Chart
- Slip Chart
- Ball charts
- The timeline

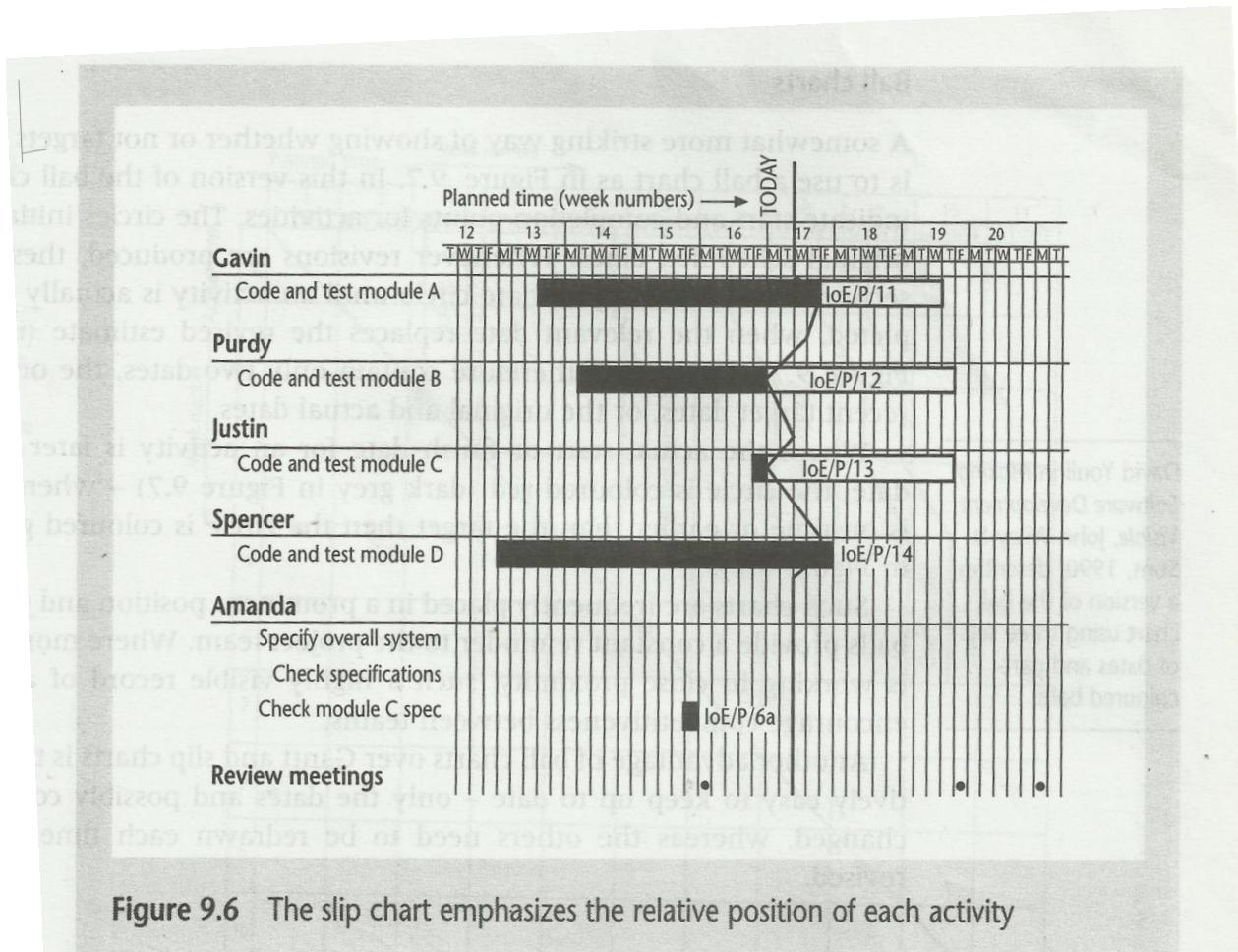
Gantt Chart

- Helps to track the project progress
- Activity bar chart indicating the scheduled activity dates and durations frequently augmented with floats
- Reported progress are shaded in the activity bars
- Today cursor provides visual indication of which activities are head or behind schedule.



slip chart

- A slip chart is simply a chart of a product's schedule slips
- It provides a more striking visual indication of those activities that are not progressing to schedule.
- More the slip line bends ,greater the variation from the plan.



**Figure 9.6** The slip chart emphasizes the relative position of each activity

### The slip chart

#### BALL WALL CHART

- Circle Initially contain the original scheduled dates.
- After Revision, current status date is entered in the circle with bold italic
- Red color- if the activity is not completed
- Green color-if the activity is completed on time or earlier.

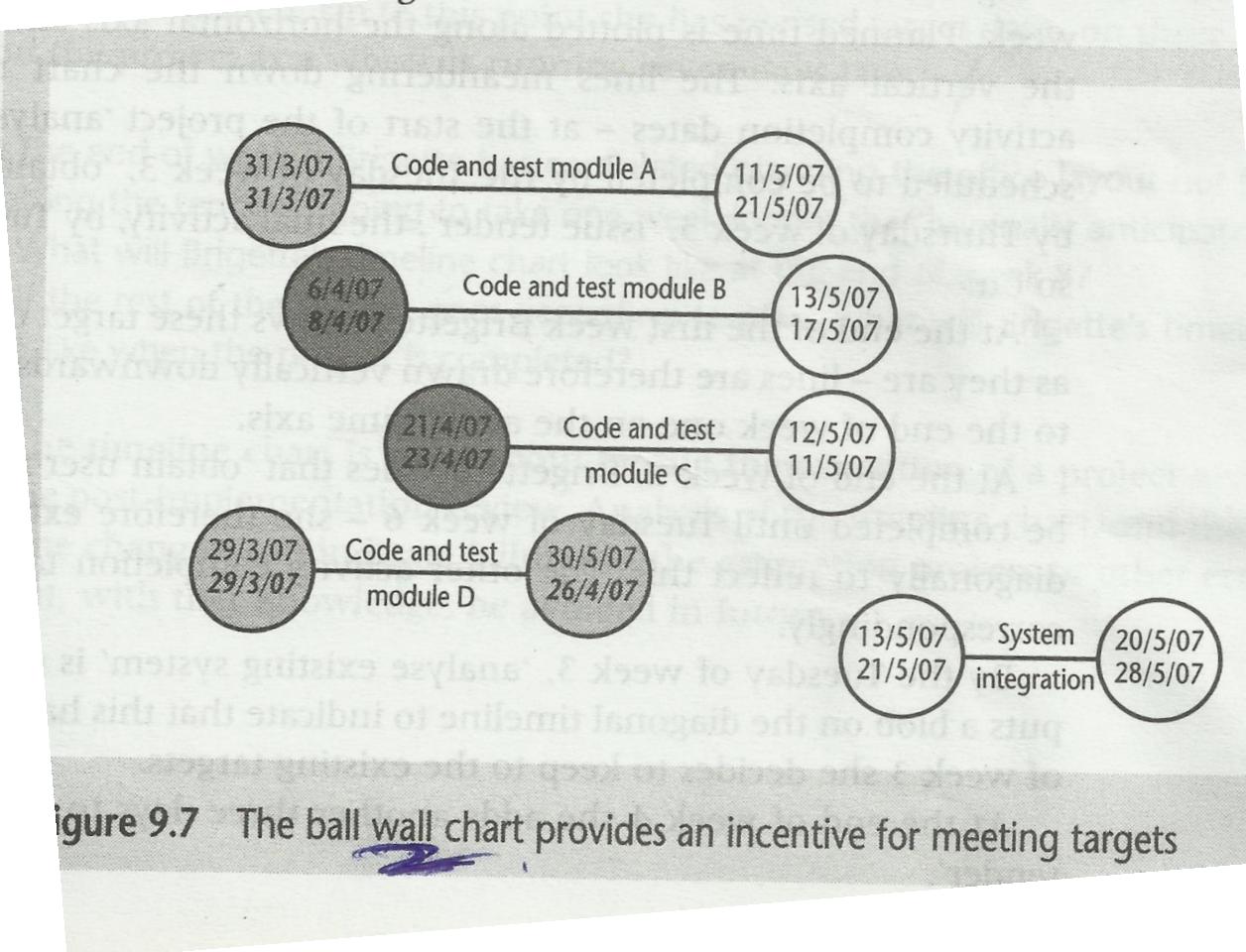
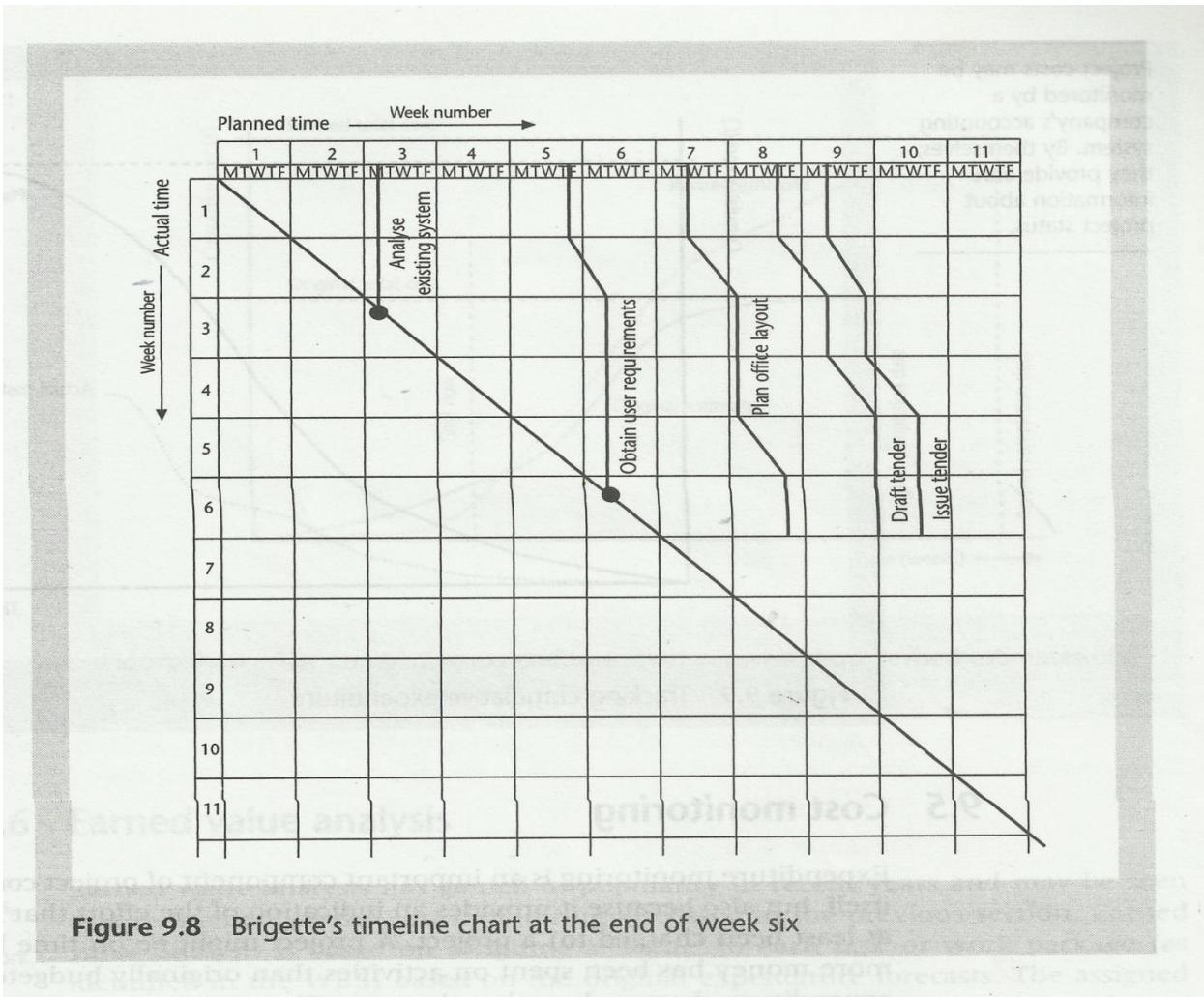


figure 9.7 The ball wall chart provides an incentive for meeting targets

### Timeline charts

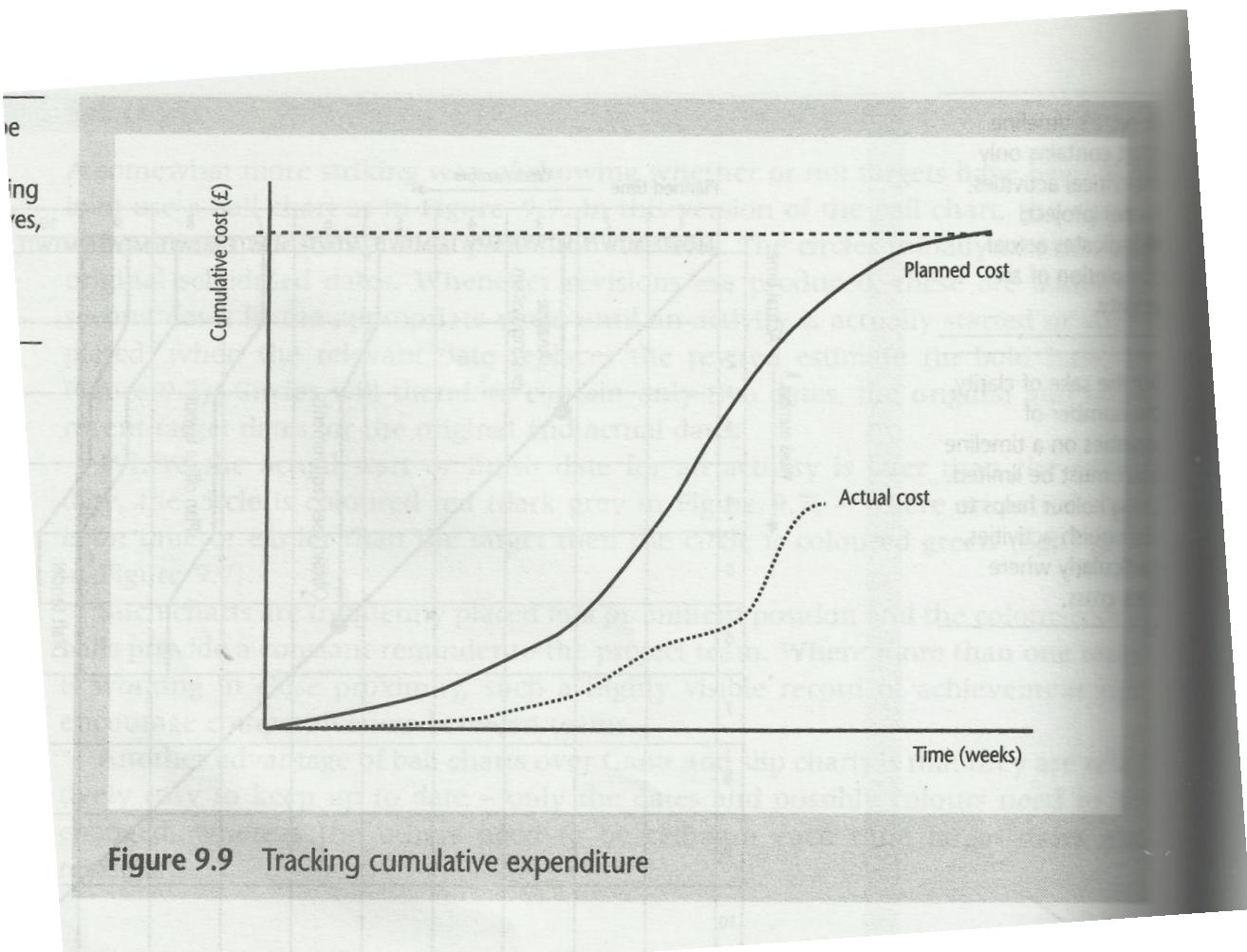
- It is a method of recording and displaying the way in which targets have changed throughout the duration of the project.



**Figure 9.8** Brigette's timeline chart at the end of week six

### Cost Monitoring

- A cumulative expenditure chart provides the simple method of comparing actual and planned expenditure
- Cost chart becomes more useful if we add projected future cost calculated by adding the estimated cost of uncompleted work to the cost already incurred
- In this case it appears that the project is behind schedule and over budget.



**Figure 9.9** Tracking cumulative expenditure

### Earned Value Analysis

- It is based on assigning value to each task or work package.
- The assigned value is the original budgeted cost for the item – Planned value(pv) or Budgeted cost of scheduled work(BCSW)
- A task that has not started – 0. once is completed it is credited with the value.
- The total value credited to the project – Earned value Or (BCWP).

### Common Methods

- 0/100 technique
- 50/50 technique
- Mile stone technique

## The Base line budget

- First stage
- Shows the forecast growth in earned value through time.
- Monitored earned value
- This is done by monitoring the completion of the task ie activity starts and mile stone achievement.
- The actual cost of each task - AC or ACWP
- Schedule variance
  - Earned Value -Planned value
  - Measured in terms of cost
  - Indicates the degree to which the value of completed work differs from that planned.
  - -negative sv means the project is behind the schedule.

## Cost variance

- Earned value-Actual cost
- Indicates the difference between the budgeted cost and actual cost of completed work.
  - negative cv means the project is over cost.
- Performance ratio
- Cost performance index  $CPI=EV/AC$
- Schedule performance index  $SPI=EV/PV$
- If value  $>1$ , the work is being completed better than plan else work is costing more than budgeted
- Estimate at completion  $EAC= BAC/CPI$  (Budget at completion)

## Prioritizing Monitoring

- Critical Path activity

- Activity with no free float
- Activities with less than specified float
- High risk activity
- Activity using critical resources

### Getting Project back to Target

- Shorten the critical path
- Reconsider the precedence requirement

### Change Control

- Configuration Librarian Role
- Change Control Procedures
- Changes in the scope of the system

### Configuration Librarian Role

- Identifies the item
- Establishment and maintenance of master copies
- Setting and running procedures to deal with changes
- Maintenance of record

### Change Control Procedures

- Ask for change request
- The user management approve the change requirement and pass it to development staff
- The development management – look at the practicality and cost of carrying out the changes
- The development management send the report to user management – decide to go head or not
- Developers are authorized to modify.
- The copies are modified.

- After completion the user management are notified and modified copies are released for user acceptance testing.
- When user is satisfied they will authorize their operational release

## Managing Contracts

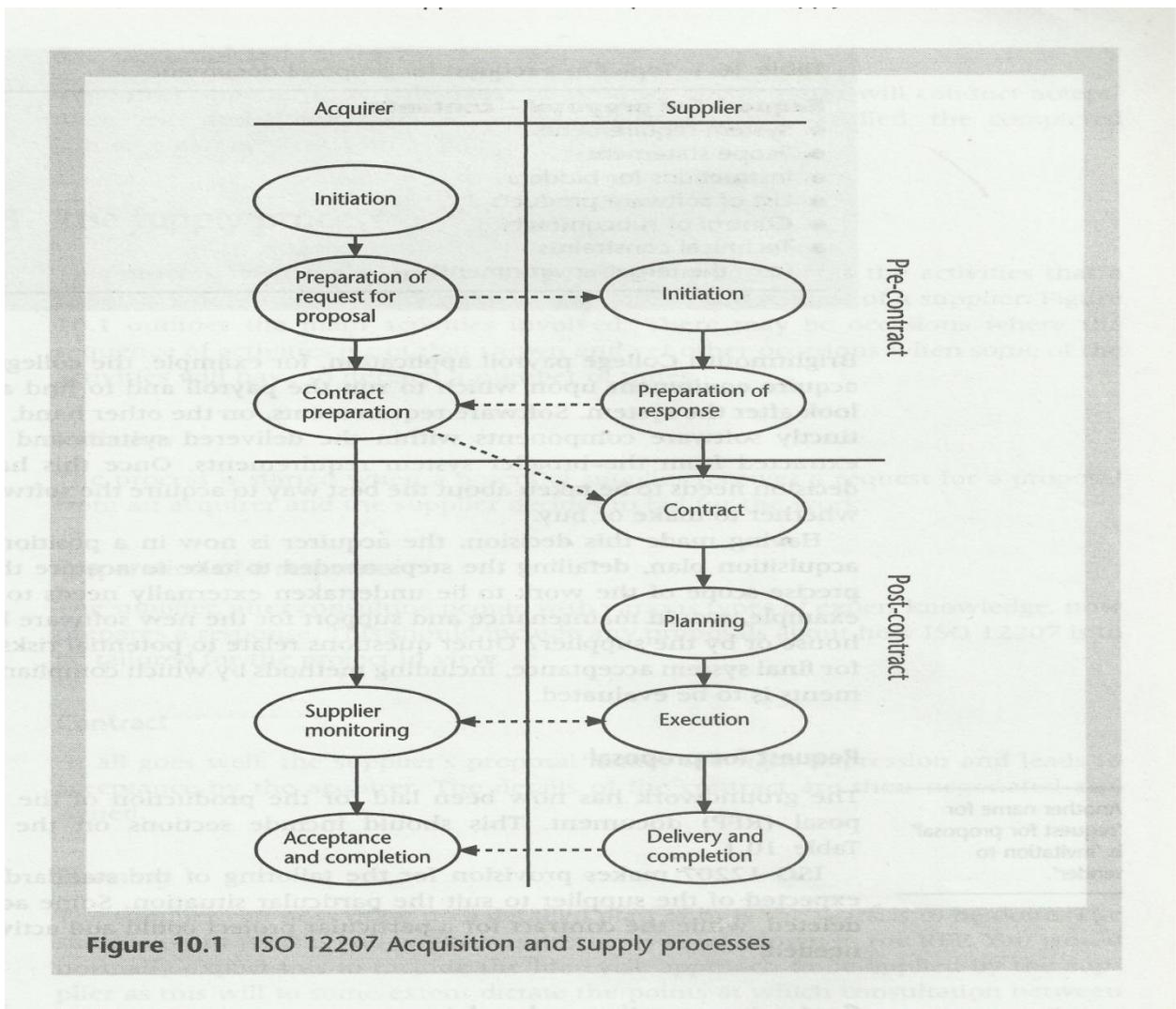
IS2207 approach to the acquisition and supply of software

- Major process relating to software
  - Acquisition
  - Supply
  - Operation
  - Maintenance
  - Development
- Acquisition process

It is the set of procedures that a customer for software should follow in order to obtain that software from an external source.

Supply process

It is the set of procedures that the supplier should adopt in order to satisfy the acquirer's needs.



**Figure 10.1** ISO 12207 Acquisition and supply processes

### Acquirer-Initiation

- System requirements
- Software requirements
- Acquisition plan –steps needed to take to acquire the software
- Identify whether to make or buy the software.

Request for Proposal  
(Invitation to tender)

**Table 10.1 Topics in a request for proposal document**

**Request for proposal – contents**

- System requirements
- Scope statement
- Instructions for bidders
- List of software products
- Control of subcontracts
- Technical constraints  
(e.g. the target environment)

Contract preparation and update

- Contract made between supplier and acquirer
- Select the supplier
  - Judging the degree of compliance by potential suppliers

Monitor supplier

- Joint reviews
- Audit
- Verification
- validation

Accept completed contract

- Conduct acceptance tests ,if satisfied

The completed software can be signed off as completed.

#### Supply process

- Gives response to RFP

#### Initiation

- Process started when a potential supplier receives a request for a proposal from an acquirer and the supplier decides to bid for the work.

#### Preparation of response

- Proposal about how ISO12207 is to be tailored for the project in view.

#### CONTRACT

- Contract are negotiated and signed if the proposal is impressed by the acquirer

#### Planning

- Detailed plan of how the work is to be done
- Starting point will be the requirement as laid down in the RFP.
- Include Life cycle approach
- During development, consultation between acquirer and supplier takes place
- Supplier can also decide whether to make or buy the software.

#### Execution and Control

- Plan is executed
- During execution, the standard expects the supplier to monitor and control progress and product quality
- Record the problem that occur.
  - Analyze and find the solution

#### Review and evaluation

- Allow the acquirer to review the progress of the project.
- the supplier documentation can be reviewed which is specified in the contract.

#### Delivery and completion

- See any procedure involved in delivering the project (any management plans)
- Identify whether post delivery support is to be provided.

Types of contract

- Contract placed for the completed software package are,
- A bespoke system
- An off the shelf package
- Customized off the shelf software

Contracts are classified as

- Fixed price contracts
- Time and materials contracts
- Fixed price per delivered unit contract

Fixed price contracts

- Here the price is fixed when the contract is signed
- Advantages
- Known customer expenditure
- Supplier motivation
- Disadvantages
- Higher prices to allow for contingency
- Difficulties in modifying requirements
- Upward pressure on the cost of changes
- Threat to system quality

Time and materials contracts

- Here the customer is charged at a fixed rate per unit of effort
- Advantages
- Ease of changing requirements

- Lack of price pressure
- Disadvantages
- Customer liability
- Lack of incentives for supplier

Fixed price per delivered unit contract

- The size of the system to be delivered is calculated in FP's. A price per unit is quoted. The final price is then the unit price multiplied by the no of FP's.
- Advantages
- Customer understanding
- Comparability
- Emerging functionality
- Supplier efficiency
- Life cycle range
- Disadvantages
- Difficulties with software size measurement
- Changing requirements

Categorizing contract according to contractor selection

- Open tendering process
- Restricted tendering process
- Negotiated procedure

Stages in contract placement

- Requirement analysis
- Evaluation plan
- Invitation to tender
- Evaluation of proposals

### Requirement analysis

- External consultant can draw up a requirements document.
- Check requirements reflects their needs.
- Functional requirements ,quality requirements

Table 10.4 Main sections in a requirements document

- 
- 1 Introduction
  - 2 A description of any existing systems and the current environment
  - 3 The customer's future strategy or plans
  - 4 System requirements
    - mandatory
    - desirable
  - 5 Deadlines
  - 6 Additional information required from potential suppliers
- 

### Evaluation plan

- Check mandatory requirement
- Consider desirable requirement
- Calculate the cost for the whole life time of the proposed system
- Increase in quality- increase in cost

### Invitation to tender

- It contains the requirement document with supporting letter which specifies how to prepare the response
- Deadline specified

#### Terms used in contract

- Form of agreement
- Goods and services to be supplied
  - Services
    - Training, documentation ,installation, conversion of existing files,maintanence agreements and Transitional insurance arrangements
- Ownership of the software
- Environment
- Customer commitments
- Acceptance procedures
- Standards
- Project and quality management
- Timetable
- Price and payment method
- Miscellaneous legal requirements

#### Contract Management

- Communication between the supplier and customer while contracted work is being carried out.
- At a certain decision point the customer might wish to examine the work already done and make decision about the future direction of the project.
- The supplier and customer reps are needed to interact at many points in the development cycle.

#### Acceptance

- When the work has been completed, the customer needs to take action to carry out acceptance testing.
- Time limit is set for acceptance testing.