

Chap. 3

Project Design

Topics

- Project people
- IT role, PM role, Doc role, QA role, business development role, help desk role
- Project plan
- Risk management
- Other plans
- Integrated schedule
- Baseline cost
- Team building
- Presentation to senior management

3.1 PROJECT PEOPLE

Project Team Members

- ▶ Once the project is approved, project team members will be assigned.
- ▶ The Phase I lead may become the Project Manager or Business Development manager
- ▶ The IT lead may become the IT manager
- ▶ We will suppose that the PM is the ITM
- ▶ The other functional areas need to have a representative

Project Team Members

- Functional areas:
 - IT
 - Business development
 - Project manager
 - QA
 - Help desk
 - Documentation
 - Users

Project Contact List

- ▶ PM elaborates a list of who is involved in the project:
 - Name, job, title, position
 - Location
 - Telephone, fax, email
 - Date assigned to the project
 - Name of his manager and contact data

Stakeholder List

- ▶ PM sets a list of who has interest in the project:
 - Name, job, title, position
 - Location
 - Internal or external
 - Importance to the project (high, medium, low)
 - Current degree of support to the project (positive, negative)

3.2 OVERVIEW OF ROLES

IT Role

- ▶ Responsible for:
 - Defining the requirements
 - Designing the final product
 - Developing software
 - Integrating hardware and software
 - Testing
 - Fixing errors

Business Development Role

- ▶ Responsible for:
 - Analyzing the industry and the competition
 - Understanding the user and writing requirements and writing or helping IT writing use cases
 - Directing and driving the project
 - Presenting the project in the best possible manner

Project Manager Role

► Responsible for:

- Making sure each member of the team understands his role and interdependencies
- Facilitating communication among departments
- Managing processes
- Confirming that the deliverables within each stage of the project life cycle have been met
- Solving delay and risk problems

Quality Assurance Role

► Responsible for:

- Designing, developing, and implementing a test plan
- Testing the product to confirm to the Design Document and the Project Plan
- Making sure that the user documentation correctly explains how to install and use the product
- Managing Beta Testing

Help Desk Role

- ▶ Responsible for:
 - Defining a detailed plan (Support Plan)
 - The Support Plan defines:
 - how Help Desk personnel will be trained,
 - how users will access help,
 - how bugs will be tracked and fixed after release,
 - what training will be available to end users,
 - how updates and fixes will be sent to users.

Documentation Role

- ▶ Responsible for:
 - Designing and developing all the manuals and help files required to install, support, and answer any questions a user would have regarding the product
 - Defines what publications will be produced in the Doc Plan (may include online help, e-learning courses, manuals)
 - Working with IT to develop these documents
 - Working with QA to assure the documents are appropriate for end users

User Role

- ▶ Agile programming recommends to have a customer representative as member of the team
- ▶ Attends the team's meeting
- ▶ Explains requirements and expectations

Project Design Objective

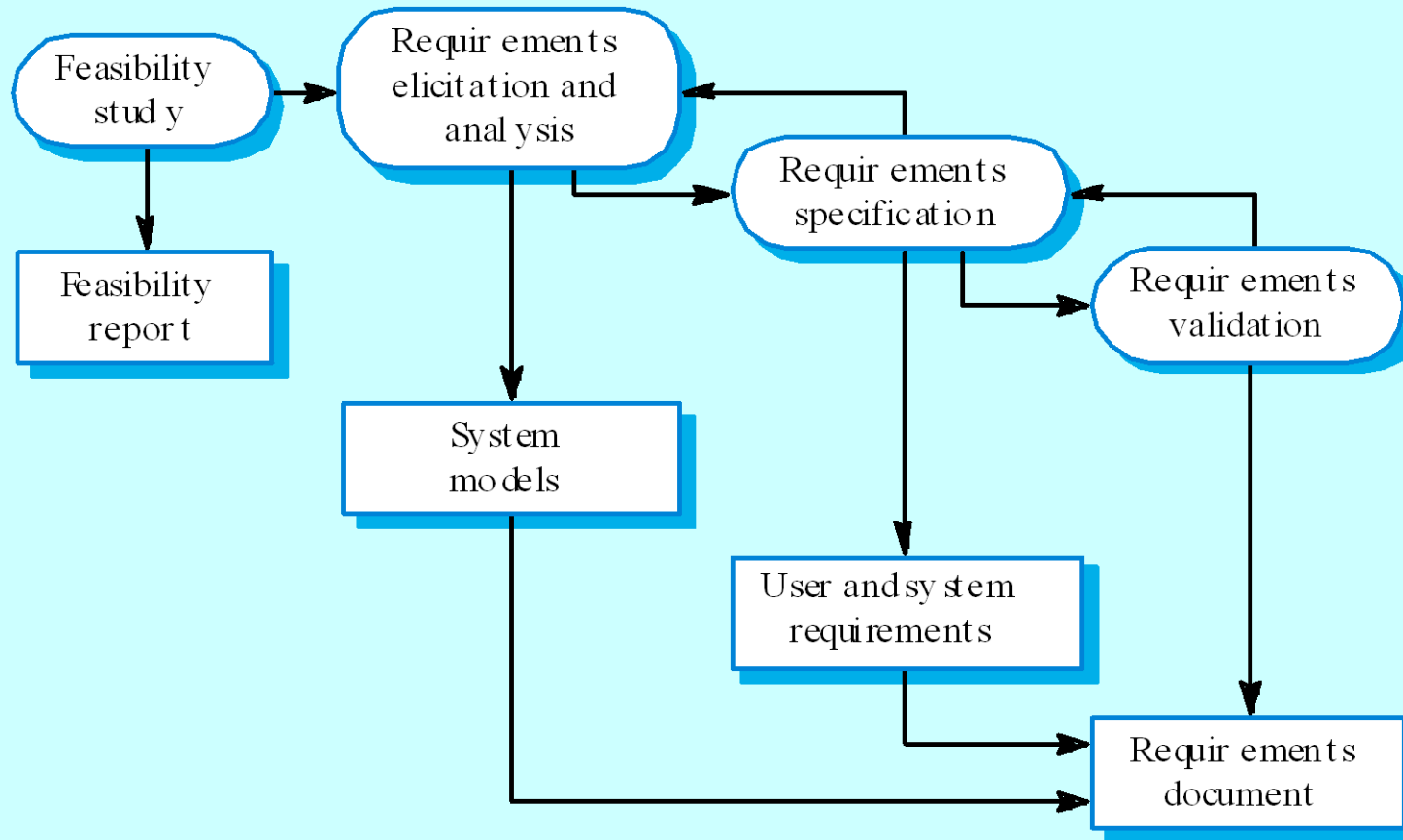
- ▶ When the project team is formed, each member receives a copy of the BRD and the FR created in Phase I
- ▶ From these documents, they begin to scope out what will be required of their organization
- ▶ By the end of Phase II, IT provides their Design Document to QA, HD, and Doc

3.3 Business Analyst's Role in Phase II

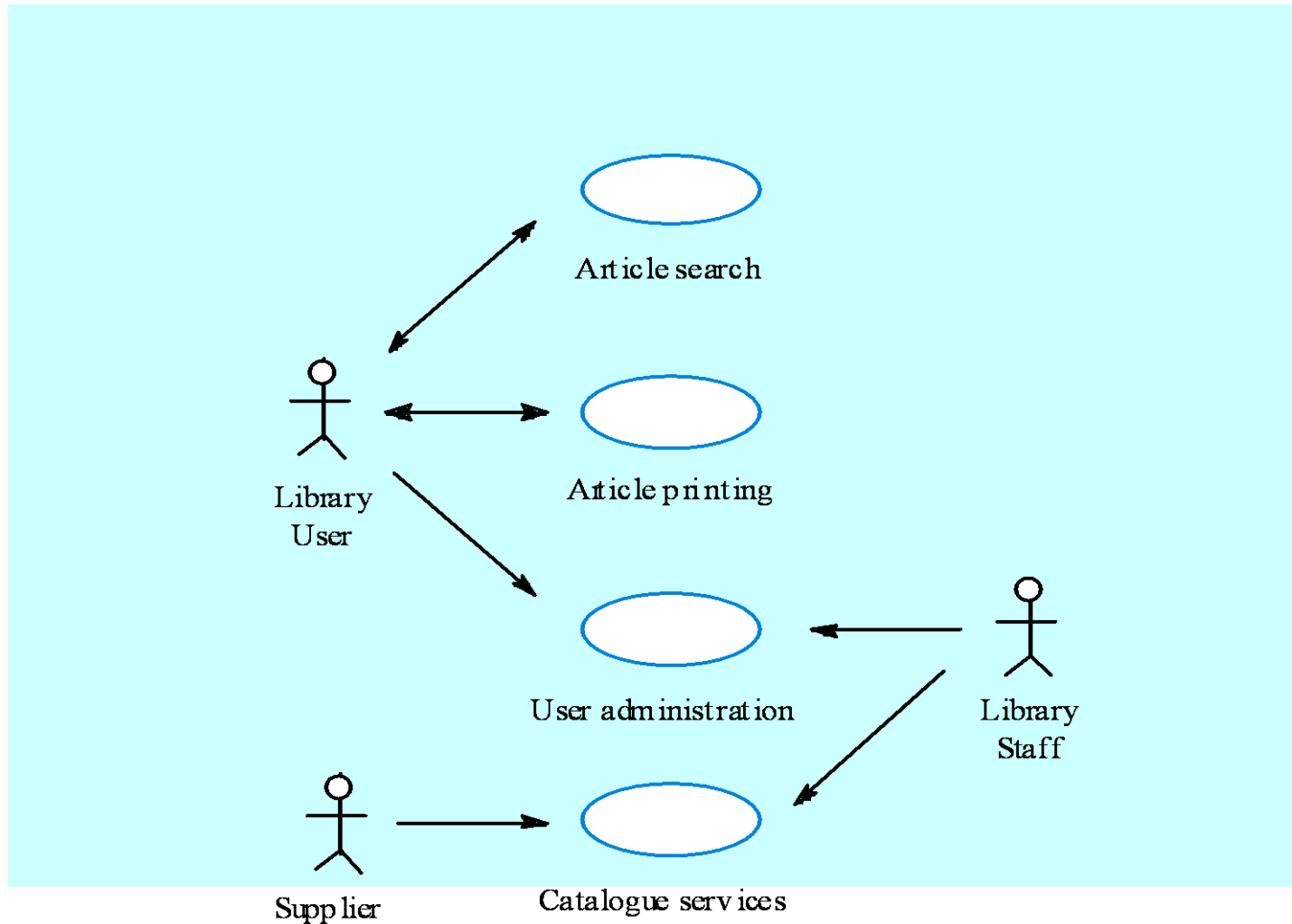
Requirements Engineering

- ▶ The Business Analyst sits with the customer in order to write and refine requirements. Result: Requirements Document.
- ▶ He may write use cases or help Designer to write them.
- ▶ Once the RD ready, it will be sent to the project team members.

Requirements Engineering Process



Library System Use Cases



3.4 PM and IT's Role in Phase II

PM and IT's Role

- ▶ PM does/organizes a RD review. He may invite some IT team members.
- ▶ Points to be checked:
 - Validity. Does the system provide the functions which best support the customer's needs?
 - Consistency. Are there any requirements conflicts?
 - Completeness. Are all functions required by the customer included?
 - Realism. Can the requirements be implemented given available budget and technology?
 - Verifiability. Can the requirements be checked?

PM and IT's Role

- ▶ Designer should be a senior programmer
- ▶ The Design team may consist of
 - Design lead who will go to meetings,
 - Designers
 - Person responsible for documenting the design
 - Person responsible for developing a prototype and design tests

PM and IT's Role

- ▶ Design might be for new software, integration of new HW and SW, upgrade to existing HW and SW, or purchase of new SW.
- ▶ Designer may prioritize requirements and identify crucial issues.
- ▶ Prototypes may be created in the Design phase so Designer can ensure his ideas are workable.

PM and IT's Role

- ▶ If the project requires that hardware or software be purchased and integrated, the PM and IT review the requirements, identify the solution, and come up with a proposed integration and release plan
- ▶ PM provides these plans to the project team so each department can create their own plan
- ▶ Once the plans are completed, an integrated schedule and a more accurate pricing can be elaborated

Ingredients for Good Design

- ▶ View the design from many angles. If all the constraints were removed would the design be different? If so, it is beneficial to reevaluate the design.
- ▶ Designing is an interactive process. Designers should continually test their design theory.
- ▶ Go for a clean and simple design (ease of development, evolution and maintenance)

Ingredients for Good Design

- ▶ Beware of shortcuts—they usually don't save time. Many companies use "free ware" to save time. It may be difficult to debug and may not have the necessary features for growth (evolution and scalability)

PM and IT's Role

- ▶ Designer comes up with a Design Document
- ▶ PM may decide to have a design review conducted in front of a group of senior members of the company's IT staff.
- ▶ Design reviews confirm that the project's design is efficient and realistic.

PM and IT's Role

- ▶ PM gives a copy of the DD to the project team members so they can know more about the responsibility of their departments
- ▶ The PM roughly reviews with the team member everyone's role, responsibility, and Phase II deliverables.

PM and IT's Role

- ▶ PM ensure deliverables satisfy the SMART test:
 - Specific: clearly defined with completion criteria
 - Measurable: understood metrics are available
 - Achievable: environment and skills available
 - Realistic: objectives are known and possible to make
 - Timebound: limited by a delivery date

3.5 OTHER PROJECT TEAM MEMBERS ROLES

QA and Documentation's Role

- ▶ IT presents the design to QA and Documentation
- ▶ Each of QA and Documentation develop a plan that outlines their department's deliverables
- ▶ They also provide their capital, resource, and time needs to the PM
- ▶ IT will support and assist QA and Documentation in their efforts to create their plans for the project

QA and Documentation's Role

- ▶ QA identifies a specific level of quality for the project and a list of tests to run
- ▶ Documentation specifies the type of documentation that will be made available and the level of technical detail

Help Desk's Role

- ▶ IT present the design to Help Desk and Business Development
- ▶ Help Desk and Business Development identify any special needs that users may have
- ▶ HD also look to see what their department will need in order to learn about, support, and identify problems once the project is released
- ▶ Help Desk will review the documentation plan once it is ready

Help Desk's Role

- ▶ Help Desk plan: identifies the level of support they are prepared to supply. The section might also specify that Help Desk personnel will be prepared to answer questions on the following topics; that user calls will be answered within thirty minutes on the following topics; and that e-mail requests will be responded to within four business hours.

Project Manager's Role

- ▶ Based on the RD, DD, QA Plan, Doc Plan, and HD Plan, PM creates a Project Plan, an Integrated Schedule and a Baseline Cost Document.
- ▶ If SW/HW needs to be purchased, in Phase III–Development, the PM and IT will review different vendors' solutions. PM (IT manager more appropriate if different) will negotiate the delivery schedule

3.6 CREATING THE PROJECT PLAN

Project Plan

- ▶ Contains a variety of information extracted from RD, DD, QA Plan, Doc Plan, and HD Plan.
- ▶ One among the main sections is on risk management

Risk management

- ▶ Identify risks and draw up plans to minimise their effect on the project.
- ▶ A risk may affect:
 - schedule or resources;
 - quality or performance of the software;
 - the organisation developing or procuring the software.

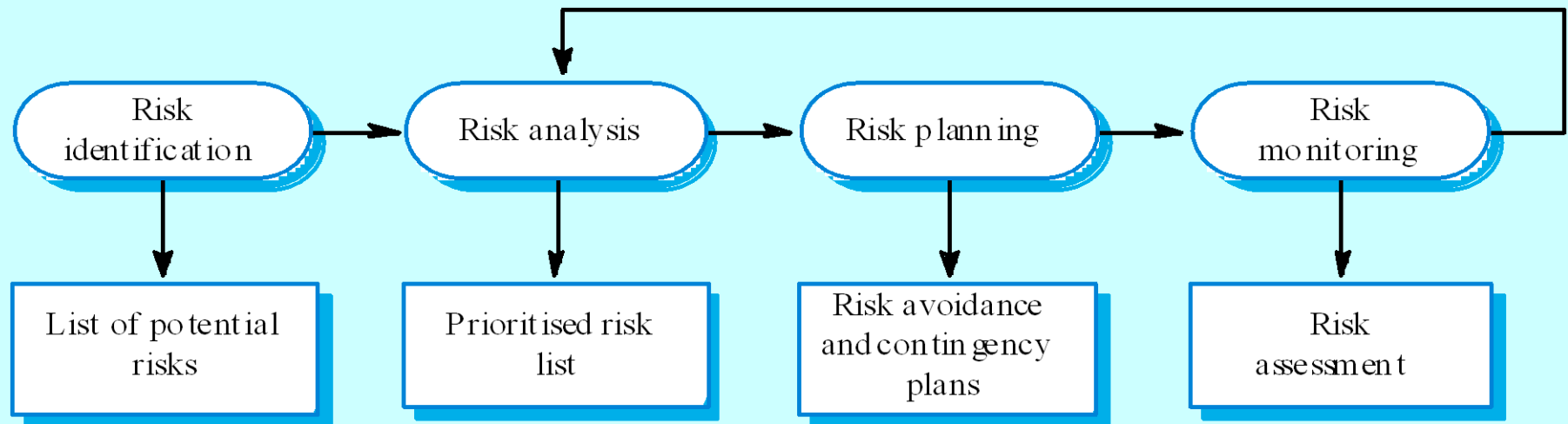
Software risks

Risk	Affects	Description
Staff turnover	Project	Experienced staff will leave the project before it is finished.
Management change	Project	There will be a change of organisational management with different priorities.
Hardware unavailability	Project	Hardware that is essential for the project will not be delivered on schedule.
Requirements change	Project and product	There will be a larger number of changes to the requirements than anticipated.
Specification delays	Project and product	Specifications of essential interfaces are not available on schedule
Size underestimate	Project and product	The size of the system has been underestimated.
CASE tool under-performance	Product	CASE tools which support the project do not perform as anticipated
Technology change	Business	The underlying technology on which the system is built is superseded by new technology.
Product competition	Business	A competitive product is marketed before the system is completed.

The risk management process

- ▶ Risk identification
 - Identify project, product and business risks;
- ▶ Risk analysis
 - Assess the likelihood and consequences of these risks;
- ▶ Risk planning
 - Draw up plans to avoid or minimise the effects of the risk;
- ▶ Risk monitoring
 - Monitor the risks throughout the project;

The risk management process



Risk identification

- ▶ Technology risks.
- ▶ People risks.
- ▶ Organisational risks.
- ▶ Requirements risks.
- ▶ Estimation risks.

Risks and risk types

Risk type	Possible risks
Technology	The database used in the system cannot process as many transactions per second as expected. Software components that should be reused contain defects that limit their functionality.
People	It is impossible to recruit staff with the skills required. Key staff are ill and unavailable at critical times. Required training for staff is not available.
Organisational	The organisation is restructured so that different management are responsible for the project. Organisational financial problems force reductions in the project budget.
Tools	The code generated by CASE tools is inefficient. CASE tools cannot be integrated.
Requirements	Changes to requirements that require major design rework are proposed. Customers fail to understand the impact of requirements changes.
Estimation	The time required to develop the software is underestimated. The rate of defect repair is underestimated. The size of the software is underestimated.

Risk analysis

- ▶ Assess probability and seriousness of each risk.
- ▶ Probability may be very low, low, moderate, high or very high.
- ▶ Risk effects might be catastrophic, serious, tolerable or insignificant.

Risk analysis (i)

Risk	Probability	Effects
Organisational financial problems force reductions in the project budget.	Low	Catastrophic
It is impossible to recruit staff with the skills required for the project.	High	Catastrophic
Key staff are ill at critical times in the project.	Moderate	Serious
Software components that should be reused contain defects which limit their functionality.	Moderate	Serious
Changes to requirements that require major design rework are proposed.	Moderate	Serious
The organisation is restructured so that different management are responsible for the project.	High	Serious

Risk analysis (ii)

Risk	Probability	Effects
The database used in the system cannot process as many transactions per second as expected.	Moderate	Serious
The time required to develop the software is underestimated.	High	Serious
CASE tools cannot be integrated.	High	Tolerable
Customers fail to understand the impact of requirements changes.	Moderate	Tolerable
Required training for staff is not available.	Moderate	Tolerable
The rate of defect repair is underestimated.	Moderate	Tolerable
The size of the software is underestimated.	High	Tolerable
The code generated by CASE tools is inefficient.	Moderate	Insignificant

Risk planning

- ▶ Consider each risk and develop a strategy to manage that risk.
- ▶ Avoidance strategies
 - The probability that the risk will arise is reduced;
- ▶ Minimisation strategies
 - The impact of the risk on the project or product will be reduced;
- ▶ Contingency plans
 - If the risk arises, contingency plans are plans to deal with that risk;

Risk management strategies (i)

Risk	Strategy
Organisational financial problems	Prepare a briefing document for senior management showing how the project is making a very important contribution to the goals of the business.
Recruitment problems	Alert customer of potential difficulties and the possibility of delays, investigate buying-in components.
Staff illness	Reorganise team so that there is more overlap of work and people therefore understand each other's jobs.
Defective components	Replace potentially defective components with bought-in components of known reliability.

Risk management strategies (ii)

Risk	Strategy
Requirements changes	Derive traceability information to assess requirements change impact, maximise information hiding in the design.
Organisational restructuring	Prepare a briefing document for senior management showing how the project is making a very important contribution to the goals of the business.
Database performance	Investigate the possibility of buying a higher-performance database.
Underestimated development time	Investigate buying in components, investigate use of a program generator

Risk monitoring

- ▶ Assess each identified risks regularly to decide whether or not it is becoming less or more probable.
- ▶ Also assess whether the effects of the risk have changed.
- ▶ Each key risk should be discussed at management progress meetings.

Project Plan

More to be done in tutorial

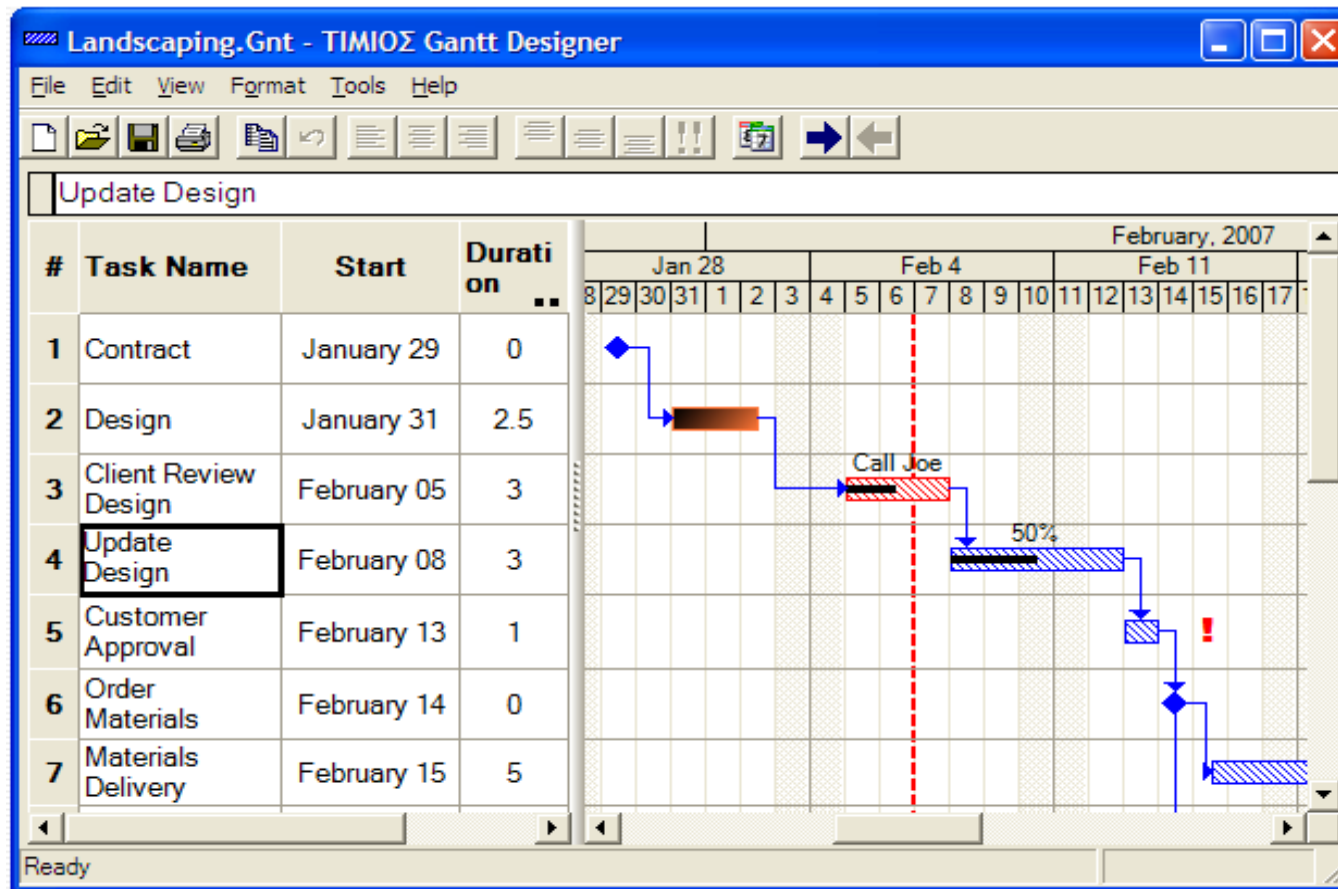
3.7 CREATING THE INTEGRATED SCHEDULE

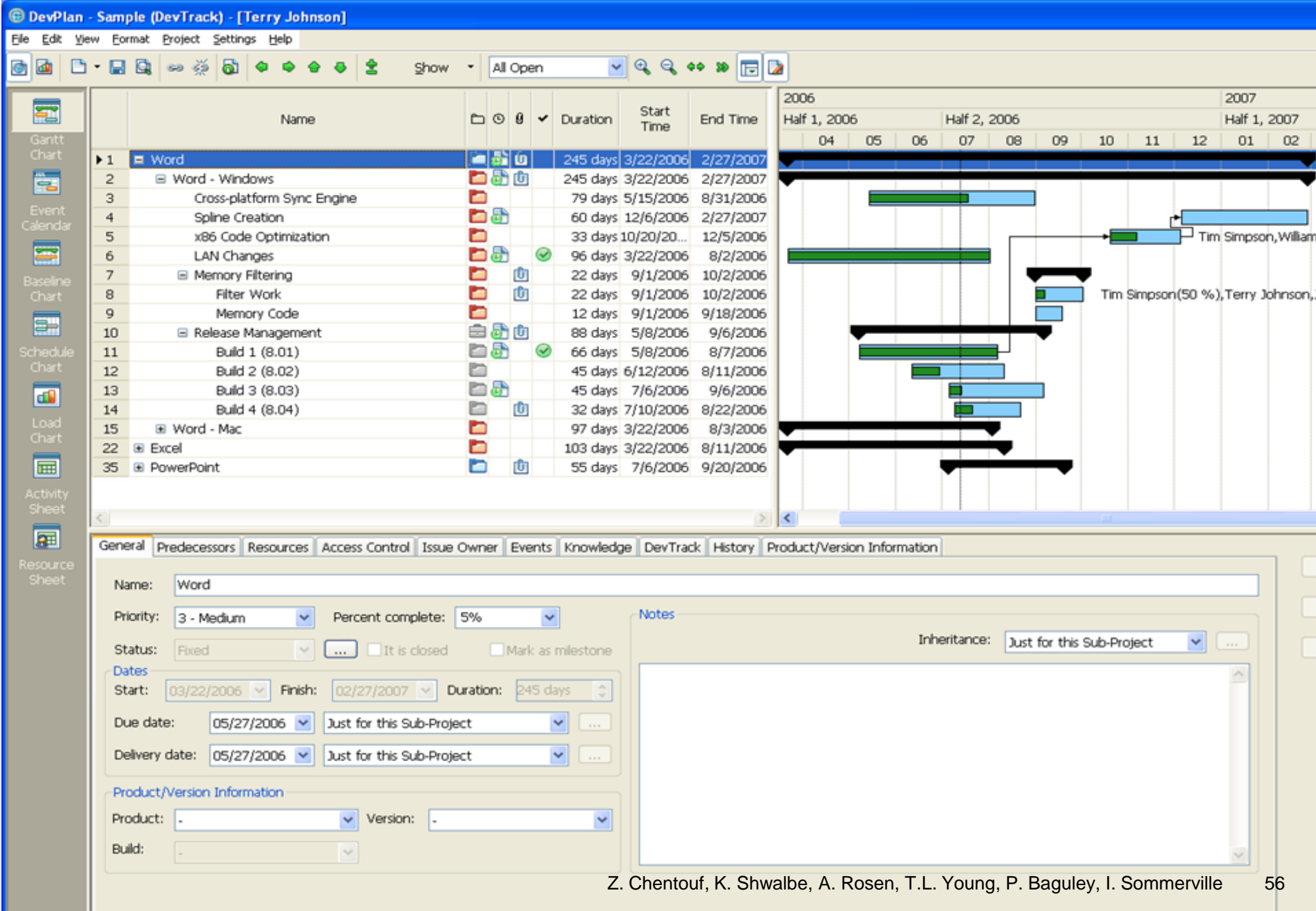
Integrated Schedule

Will be done in Chap. 4 and tutorial

- ▶ To have an idea, see the Gantt examples below

Activity timeline (Gantt)





Activity timeline (Contd)

Project: [00100 -- Manhattan IT Upgrade](#) -- Hours: 1,271.00 , Cost: \$28,770.00

	Task Name	Status	Begin	End	Hours	Cost \$	Assigned To	Preds	7/8/2007						
									S	M	T	W	T	F	S
1	<input checked="" type="checkbox"/> Planning	Completed	7/9/2007	7/20/2007	75	2,050									
4	<input type="checkbox"/> Build		7/9/2007	9/13/2007	730	10,900									
5	Install New Routers	Not Started	7/9/2007	7/20/2007	160	4,000	Sandy Surrogate								
6	Install new work stations	Not Started	7/9/2007	9/13/2007	370	4,900	Mark Manager								
7	Install new servers	Not Started	7/9/2007	7/13/2007	200	2,000	Joe User								
8	<input type="checkbox"/> Testing		7/9/2007	7/13/2007	40	400									
9	Test login	In Progress	7/9/2007	7/13/2007	40	400	Joe User								
10	Test security	Completed	7/9/2007	7/9/2007	0	0									
11	<input type="checkbox"/> Training		7/9/2007	7/9/2007	16	320									
12	Train Group 1		7/9/2007	7/9/2007	8	160	Ashley BF. Admin								
13	Train Group 2		7/9/2007	7/9/2007	8	160	Acentre Admin								
14	<input type="checkbox"/> Go Live		7/9/2007	7/26/2007	40	10,000									
15	Create Training Plan		7/9/2007	7/26/2007	40	10,000	Ashley Admin								
16	Support	Not Started	7/9/2007	7/13/2007	0	0									
17	review design docs		7/9/2007	8/7/2007	300	3,000	Joe User								
18	Update Software to V2.0	Not Started	7/9/2007	7/9/2007	0	0									
19	test	Completed	7/9/2007	7/16/2007	0	0	Carlos Computer								
20	Cleaning Convair		7/9/2007	10/9/2007	70	2,100	Carlos Computer								

Creating the Integrated Schedule

- ▶ Simple method:
 - project team members provide the PM with their departmental schedule
 - PM produces an integrated schedule

Creating the Integrated Schedule

- ▶ Better method:
 - each member of the project team presents his deliverables and prerequisites
 - each member break deliverables down by phase
 - members put all their deliverables on the board; they then identify what deliverables are prerequisites to their deliverables
 - this information can now generate an integrated schedule

3.8 CREATING A BASELINE COST DOCUMENT

Creating a Baseline Cost Document

- ▶ PM creates a Baseline Cost Document
- ▶ The BCD provides senior management with accurate picture of the real cost of the project
- ▶ The BCD will help for creating accounting documents
- ▶ Each department provides to the PM:
 - staffing
 - equipment
 - other costs

Staffing Cost

- ▶ The employee status (consultant, part-time, full-time)
- ▶ The employee's department and position (documentation-writer, documentation-editor)
- ▶ If known, the employee name
- ▶ The amount of hours this employee will be working on the project

Equipment Cost

- ▶ There may be a need to purchase equipment
- ▶ Each department identifies
 - the item,
 - the date the department will begin and finish using the item
 - the estimated cost of purchasing the item

Other Costs

- ▶ Items such as hiring a public relations firm, printing costs, and advertising
- ▶ Identify the name of the company and the item or service
- ▶ Describe how the item or service will be used,
- ▶ The length of time this item or service will be used
- ▶ The estimated price of this item or service

Creating a Baseline Cost Document

More in tutorial and Chap. 4

3.9 CREATING A TEAM

Creating a Team

- ▶ The first step in creating an effective team is to clearly lay down ground rules
- ▶ It is a good idea to create a list of ground rules at the first team meeting
- ▶ All members are responsible for showing up on time with assignments complete
- ▶ If a team member has not completed a task assigned to him it is his responsibility to notify the Project Manager before the meeting

Creating a Team

- ▶ All discussions will remain professional; all comments must be focused on tasks not people
- ▶ The Project Manager has complete authority for maintaining order
- ▶ The PM will report to the project sponsor and senior management on every member's productivity
- ▶

Creating a Team

- ▶ The PM monthly assigns an orange prize and a lemon prize
- ▶ Every member must bring his copybook in meetings. This copybook is owned by the company. Forbidden to take off pages.
- ▶ [Software process related rules]
- ▶ All team members sign the ground rules sheet

Creating a Team

More in Chap. 5

3.10 CLOSING PHASE II

Closing Phase II

- ▶ PM checks the following:
 - Are roles and responsibilities well understood and accepted?
 - Are project accountability and authority clear?
 - Is the priority and importance of the project understood?
 - Is there a business critical date for the project?

Closing Phase II

- Are the deliverables clearly defined?
- Is the project related to other projects?
- Have project risks been identified?
- Are existing communication procedures acceptable for the project?
- Do members of the team need a training?

Closing Phase II

- ▶ Project Manager makes sure all project team members and their managers receive a copy of the Project Plan
- ▶ PM obtains the approval of the senior management
- ▶ Once it is approved, it is frozen

Sign-Off Form

Project Name:

Date:

Phase:

Project Manager

Business Development

Help Desk

QA

Documentation

Approval: Yes No (circle one)

Approval: Yes No (circle one)

Approval: Yes No (circle one)

Approval: Yes No (circle one)

Approval: Yes No (circle one)

Project Design Presentation

- ▶ PM presents the Project Design to senior management.
- ▶ He brings a copy of the PP, Integrated Schedule and Baseline Cost Document.

Project Name

Phase II – Design

Review distribution includes: (list names of people receiving a copy of this document)

Agenda

- General program status
- IT overview
- Team overview
- Issues and risks

Project Status

- Team established
- PP frozen
- DD created
- Design review done
- QA Test Plan created
- Doc Plan created
- Integrated project schedule created
- Baseline Cost Document created

Integrated Schedule

	Complete Date
Development	
Documentation	
QA	
Beta	
Release	
Maintenance	

Proposed Features

Feature	Functionality
1.	
2.	
3.	
4.	
5.	

Projected Costs

	Estimated Cost from Phase 1	Current Costs
Development		
Beta		
QA		
Hardware		
Software		
Installation		
Maintenance		

Team Members

- Business Development –
- Project Manager –
- Quality Assurance –
- Help Desk –
- Documentation –

Project Manager's Deliverables

- ▶ IT team established
- ▶ Deliverables:
 - PP created
 - Baseline Cost Document created
 - Integrated schedule created

Business Dev.'s Deliverables

- Updates to Phase 1
- Requirements Document updated
- PP input provided

Doc's Deliverables

- Technical doc. plan created
- List of the documents to be created
- Notable specifications listed

QA's Deliverables

- QA test plan created
- QA engineer(s) assigned
- QA entrance criteria specified
- QA exit criteria specified

Help Desk's Deliverables

- Staffing requirements identified
- Help Desk Plan for the project created

Issues and Risks

Owner	Risk	Impact
Development		
Beta		
QA		
Hardware		
Software		
Installation		
Maintenance		