

Software Project Management



Chapter 3

Step Wise: An approach to planning software projects

'Step Wise' - aspirations

Practicality

tries to answer the question 'what do I do now?'

Scalability

useful for small project as well as large

Range of application

Accepted techniques

e.g. borrowed from PRINCE etc

**Mc
Graw
Hill** **Ed**



A project scenario: Brightmouth College Payroll

College currently has payroll processing carried out by a services company

This is very expensive and does not allow detailed analysis of personnel data to be carried out

Decision made to bring payroll 'in-house' by acquiring an 'off-the-shelf' application

Project scenario - continued

The use of the off-the-shelf system will require a new, internal, payroll office to be set up

There will be a need to develop some software 'add-ons': one will take payroll data and combine it with time-table data to calculate the staff costs for each course run in the college

The project manager is Brigitte.

Step 1 establish project scope and objectives

1.1 Identify objectives and measures of effectiveness

‘how do we know if we have succeeded?’

1.2 Establish a project authority

‘who is the boss?’

1.3 Identify all stakeholders in the project and their interests

‘who will be affected/involved in the project?’

Step 1 continued

1.4 Modify objectives in the light of stakeholder analysis

‘do we need to do things to win over stakeholders?’

1.5 Establish methods of communication with all parties

‘how do we keep in contact?’

Back to the scenario

Project authority

Brigette finds she has two different clients for the new system: the finance department and the personnel office. A vice principal agrees to be official client, and monthly meetings are chaired by the VP and attended by Brigette and the heads of finance and personnel

These meetings would also help overcome communication barriers

Back to the scenario - continued

Stakeholders

For example, personnel office would supply details of new staff, leavers and changes (e.g. promotions)

To motivate co-operation Brigitte might ensure new payroll system produces reports that are useful to personnel staff

Step 2 Establish project infrastructure

2.1 Establish link between project and any strategic plan

‘why did they want the project?’

2.2 Identify installation standards and procedures

‘what standards do we have to follow?’

(change control and configuration management standards, quality standards and procedure manuals, measurement)

2.3. Identify project team organization

‘where do I fit in?’

(SW developers, business analyst, business-to-customer web application group, database group)

Step 3 Analysis of project characteristics

3.1 Distinguish the project as either objective or product-based.

Is there more than one way of achieving success?

(tends to be more product driven and the underlying objectives always remain and must be respected)

3.2 Analyze other project characteristics (including quality based ones)

what is different about this project?

(information system, process control system, safety critical)

Step 3 continued

Identify high level project risks

‘what could go wrong?’

‘what can we do to stop it?’

Take into account user requirements concerning implementation

Select general life cycle approach

waterfall? Increments? Prototypes?

Review overall resource estimates

‘does all this increase the cost?’

Back to the scenario

Objectives vs. products

An objective-based approach has been adopted

Some risks

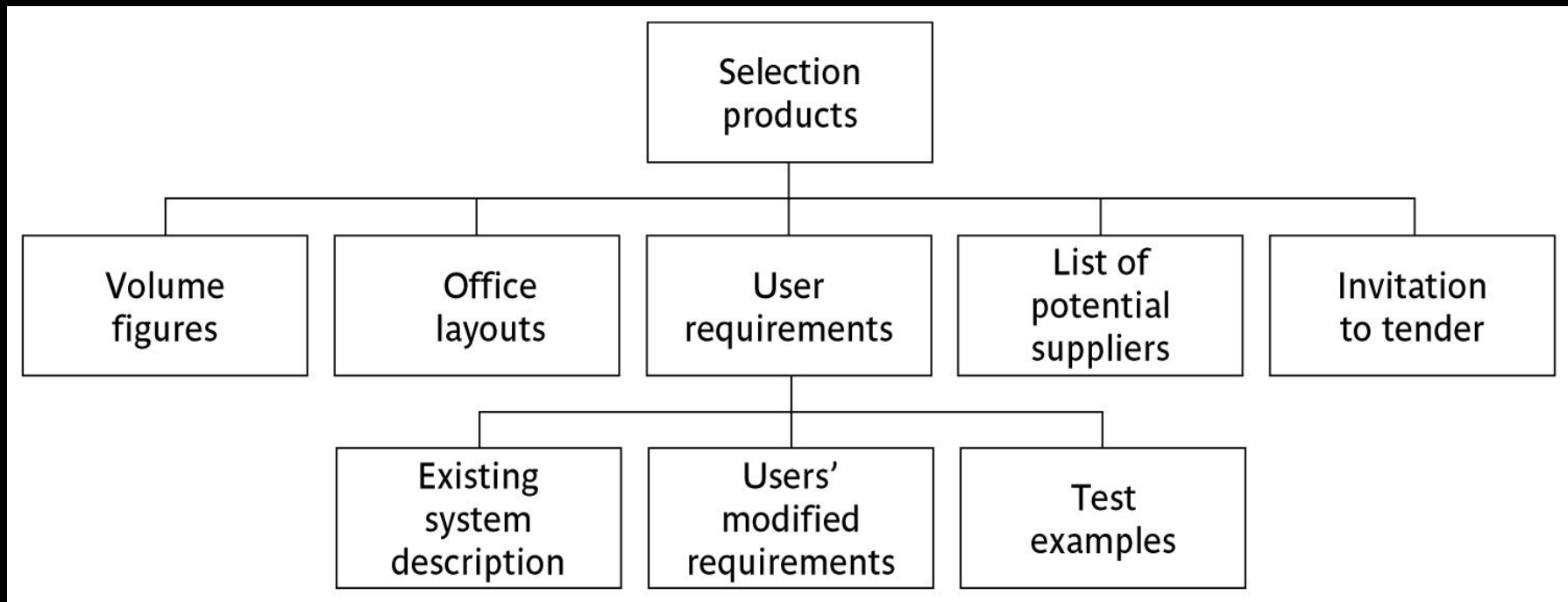
There may not be an off-the-shelf package that caters for the way payroll is processed at Brightmouth College

Answer?

Brigette decides to obtain details of how main candidate packages work as soon as possible; also agreement that if necessary processes will be changed to fit in with new system.

Step 4 Identify project products and activities

4.1 Identify and describe project products - 'what do we have to produce?'



A fragment of a Product Breakdown Structure (PBS) for a system development task

Products

The result of an activity

Could be (among other things)

- physical thing ('installed pc'),

- a document ('logical data structure')

- a person ('trained user')

- a new version of an old product ('updated software')

Products

The following are NOT normally products:

- activities (e.g. 'training')

- events (e.g. 'interviews completed')

- resources and actors (e.g. 'software developer') -
may be exceptions to this

Products CAN BE *deliverable* or *intermediate*

Product description (PD)

Product identity

Description - what is it?

Derivation - what is it based on?

Composition - what does it contain?

Format

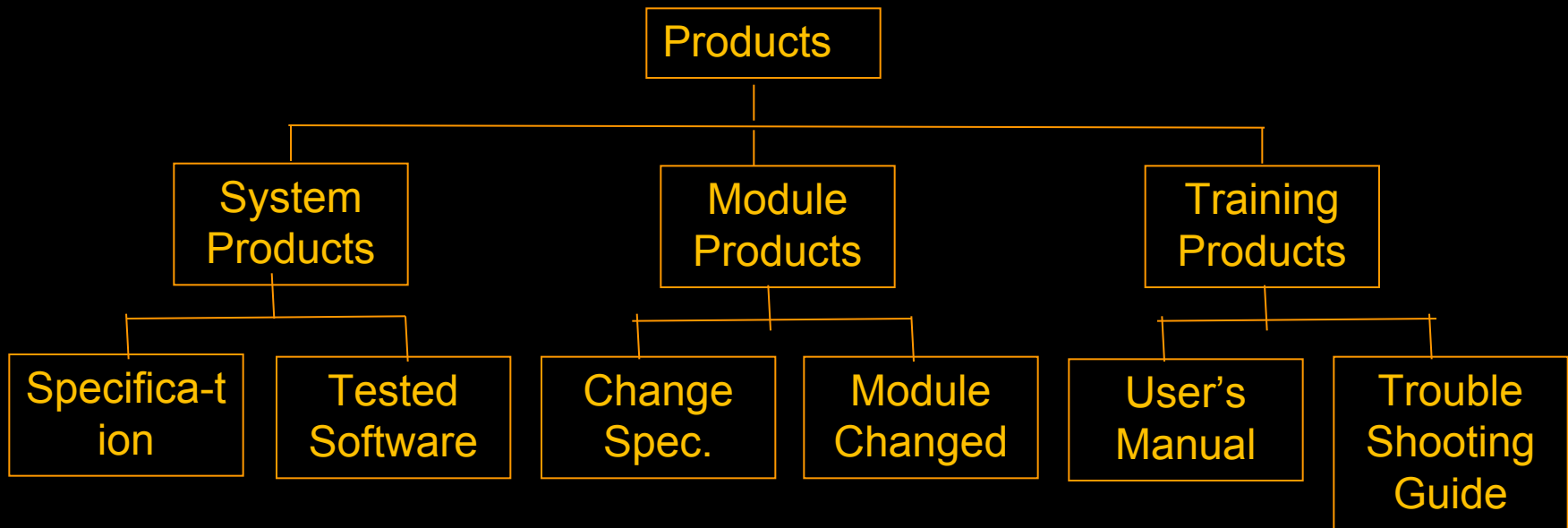
Relevant standards

Quality criteria whether the product is acceptable

- *Create a PD for 'test data'*

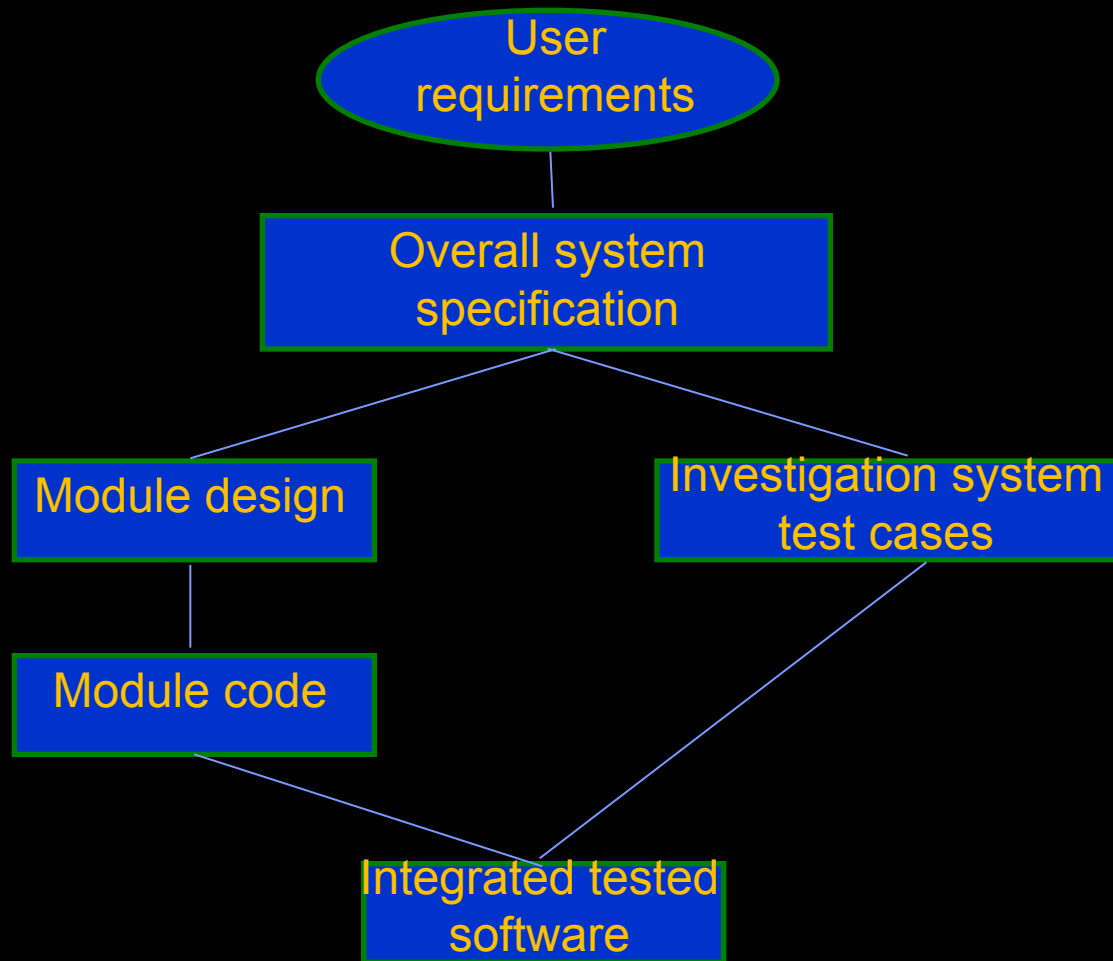
Exercise:

What would be the product breakdown structure of the deliverables of the vendor who would develop the Brightmouth College payroll software by customizing one of its existing products?



4.2 document generic product flows

- ❑ A program design must be created before the program can be written and program specification must exist.
- ❑ The relationships can be portrayed in a Product Flow Diagram (PFD).
- ❑ Flow on the diagram to be from top to bottom and left to right.
- ❑ User requirement is an oval.



PFD for a software development task

Exercise:

Draw up a possible **Product Flow Diagram** (PFD) based on **Product Breakdown Structure** (PBS) to identify some of the products of Brightmouth payroll project based on the information gathered. This is to be presented to potential supplier of the hardware as a part of an 'invitation to the tender'.

The volume of figures are the number of employees for whom the records will have to be maintained.

Step 4 continued

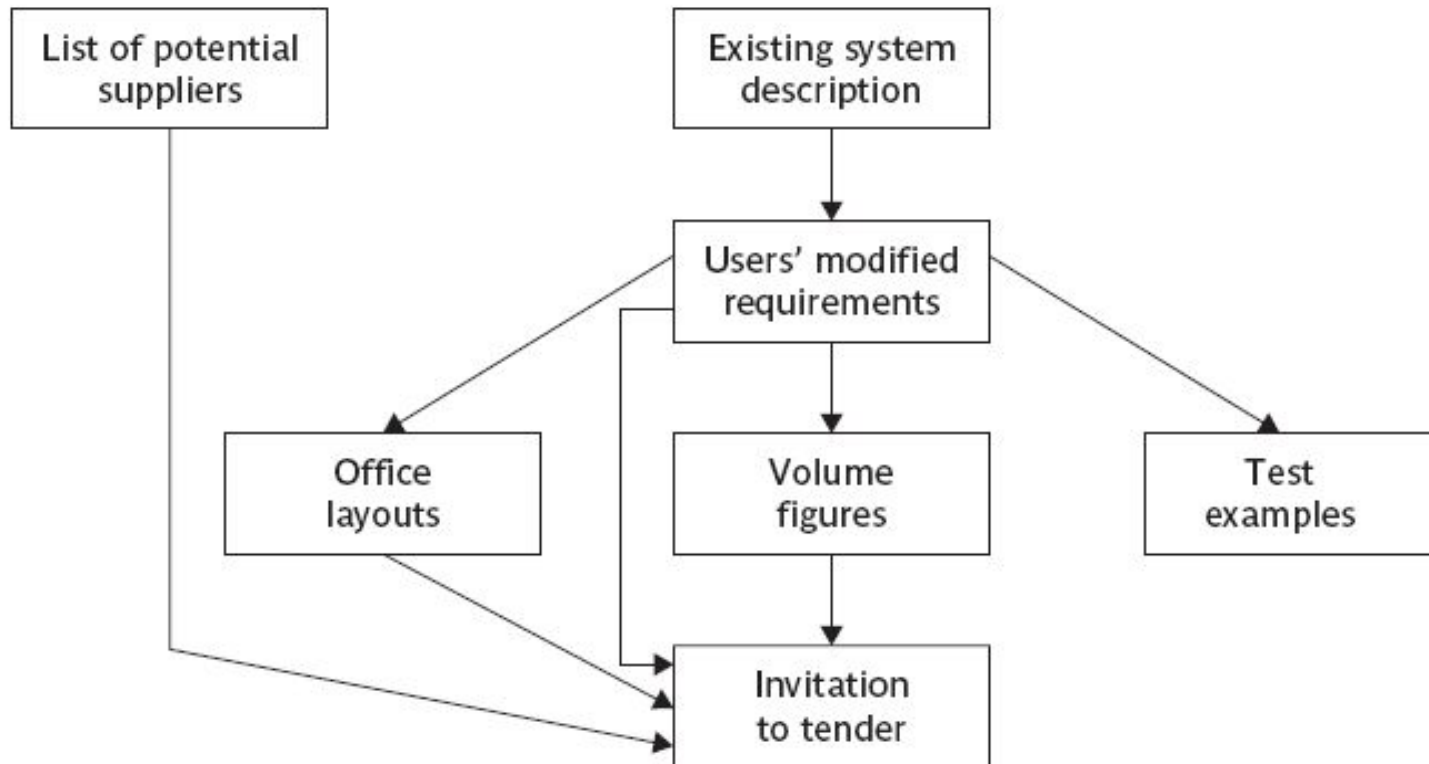


FIGURE B.1 Product Flow Diagram for the creation of an 'invitation to tender'

Step 4.3 Recognize product instances

The PBS and PFD will probably have identified generic products e.g. 'software modules'

It might be possible to identify specific instances e.g. 'module A', 'module B' ...

But in many cases this will have to be left to later, more detailed, planning

4.4. Produce ideal activity network

Identify the activities needed to create each product in the PFD

More than one activity might be needed to create a single product

Hint: Identify activities by **verb + noun** but avoid 'produce...' (too vague)

Draw up activity network

An 'ideal' activity

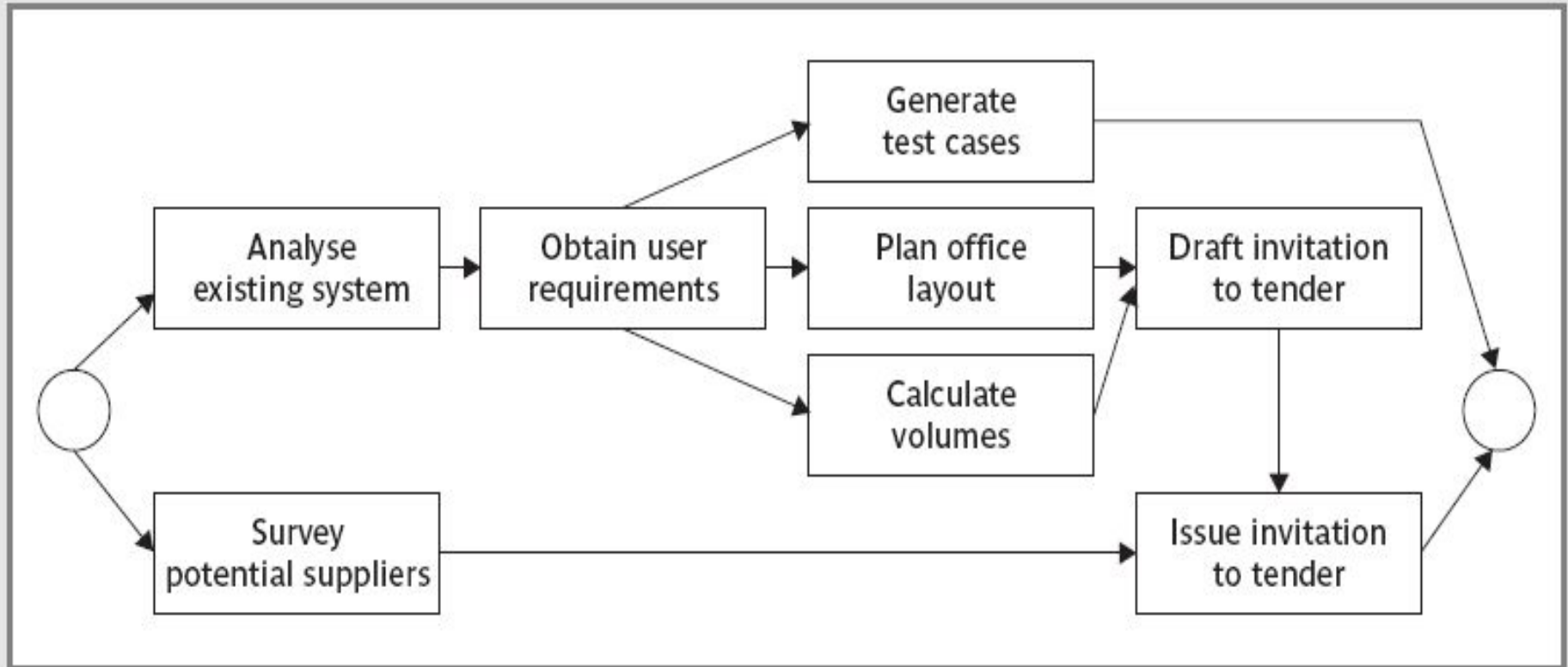
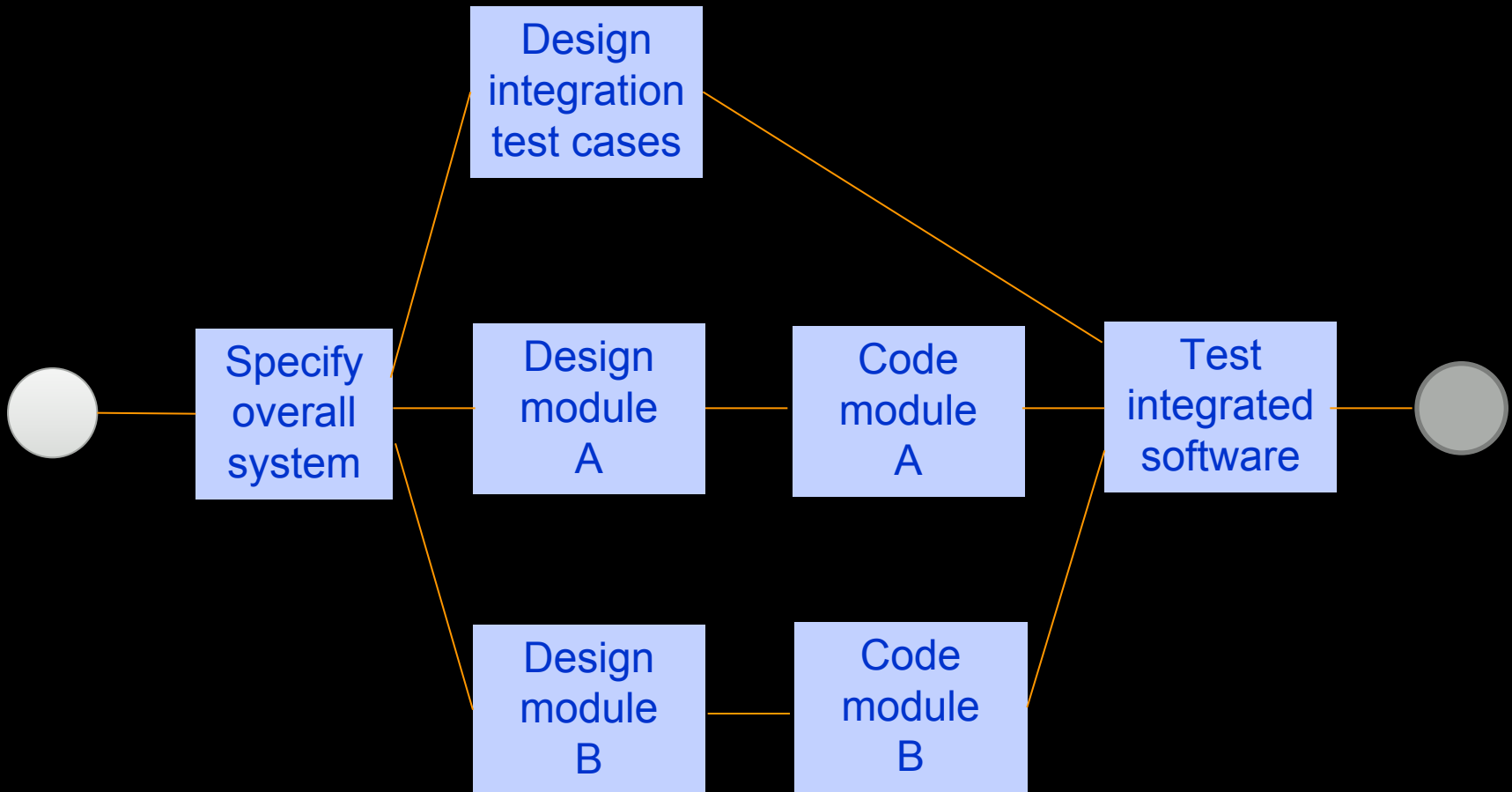


FIGURE B.2 Brightmouth College payroll project activity network fragment

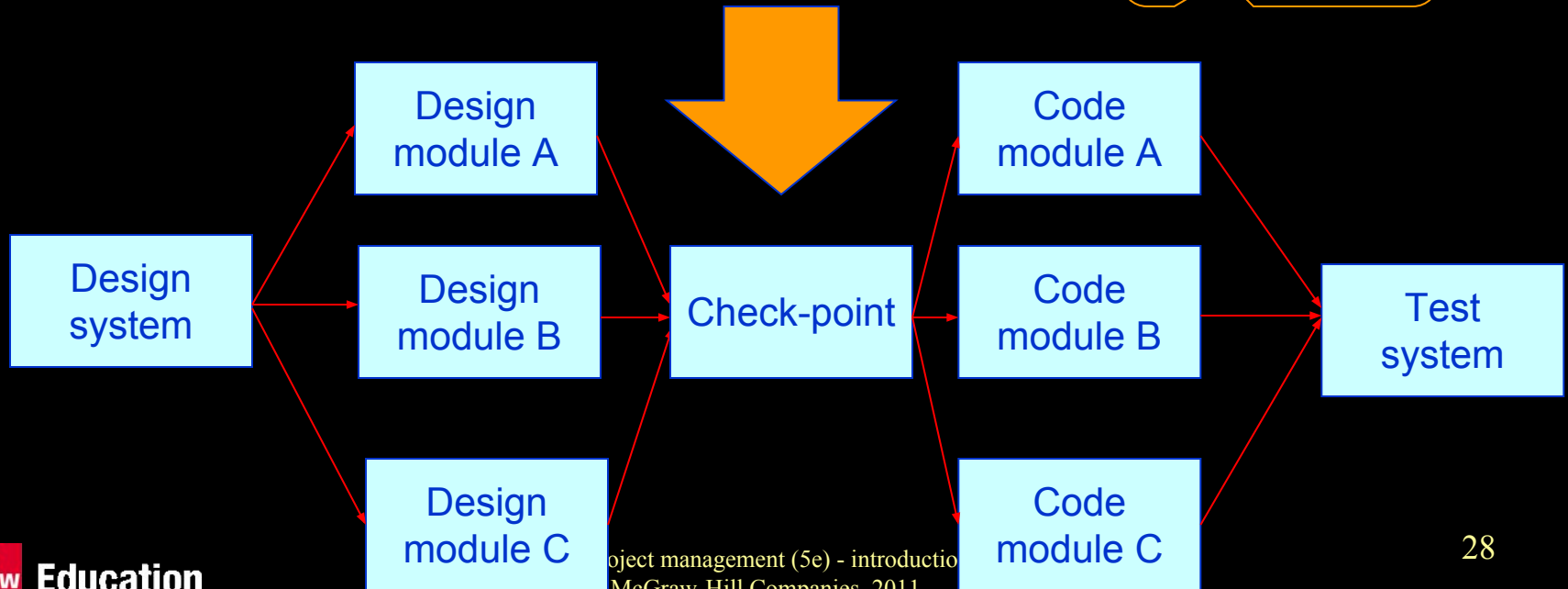
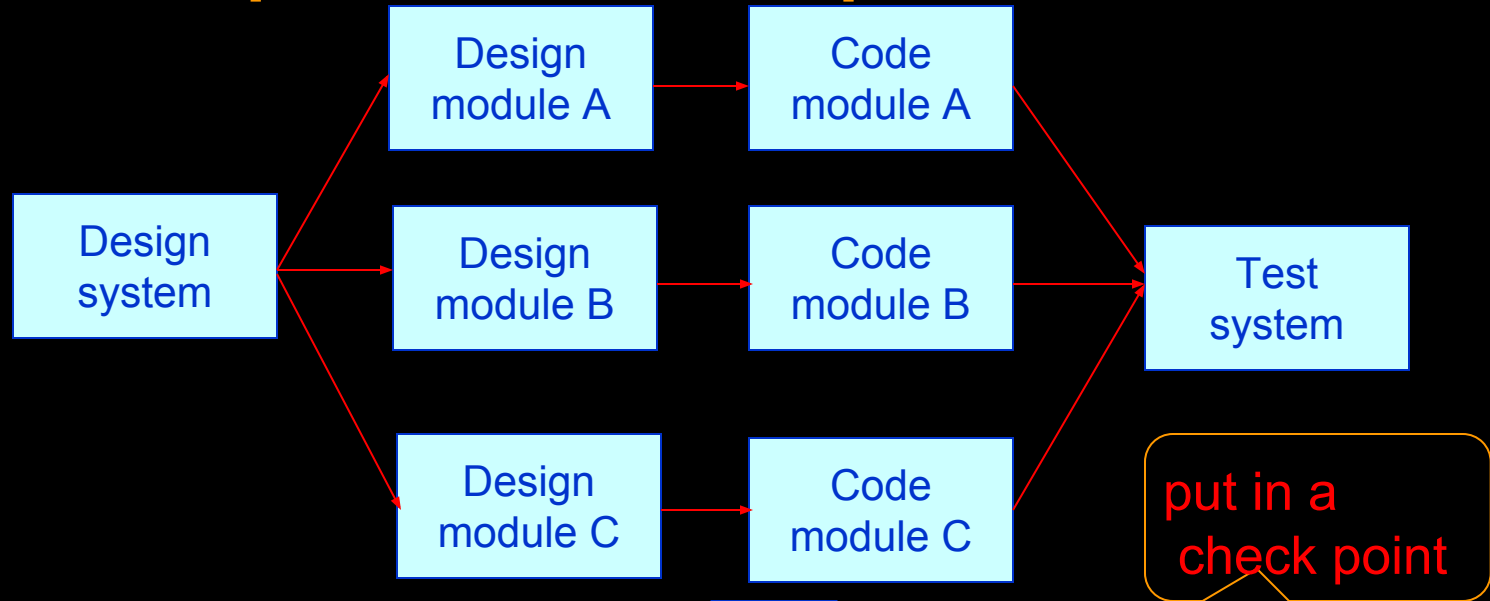


Another example of an activity network

Step 4.5 Add check-points if needed

- An activity will start as soon as the preceding ones are completed.
- Sometimes as per need, divide the project into stages and introduce a check point activities.
- Check point ensures the preceding activities together are complete and compatible.
- This may delay work on some elements of the project.
- There should be a trade-off between efficiency and quality.

Step 4.5 Add check-pointscont



Step 5: Estimate effort for each activity

5.1 Carry out bottom-up estimates

distinguish carefully between *effort* and *elapsed* time (2 persons work for 2 days, the effort is 6 days. Elapsed time is between start and of the task. Here the elapsed time is 2 days.)

5.2. Revise plan to create controllable activities

(If an activity involving system testing is to take 12 weeks, it is difficult after six weeks to judge whether 50% work is completed.)

break up very long activities into a series of smaller ones

bundle up very short activities (create check lists?)

Step 6: Identify activity risks

6.1. Identify and quantify risks for activities

Damage, if risk occurs (measure in time lost or money)

Likelihood, if risk occurring (most likely estimate)

6.2. Plan risk reduction and contingency measures

(contingency plans specify actions to be taken if risk materializes e.g. use a contract staff if a project member is not available or sick.)

risk reduction: activity, to stop risk occurring

contingency: action, if risk does occur

6.3 Adjust overall plans and estimates to take account of risks

e.g. add new activities which reduce risks associated with other activities e.g. training, pilot trials, information gathering

Step 7: Allocate resources

7.1 Identify and allocate resources to activities

(staff available for the project are identified and are provisionally allocated to tasks)

7.2 Revise plans and estimates to take into account resource constraints

e.g. staff not being available until a later date
non-project activities

Gantt charts

LT = lead tester
TA = testing assistant
ITT = Inf. Tech. transfer

Week
commencing

MARCH

5

12

19

26

APRIL

2

9

16

Survey potential
suppliers

Finance assistant

Analyse existing
system

Business analyst

Obtain user
requirements

Business analyst

Generate test cases

Systems assistant

Plan office layouts

Premises office

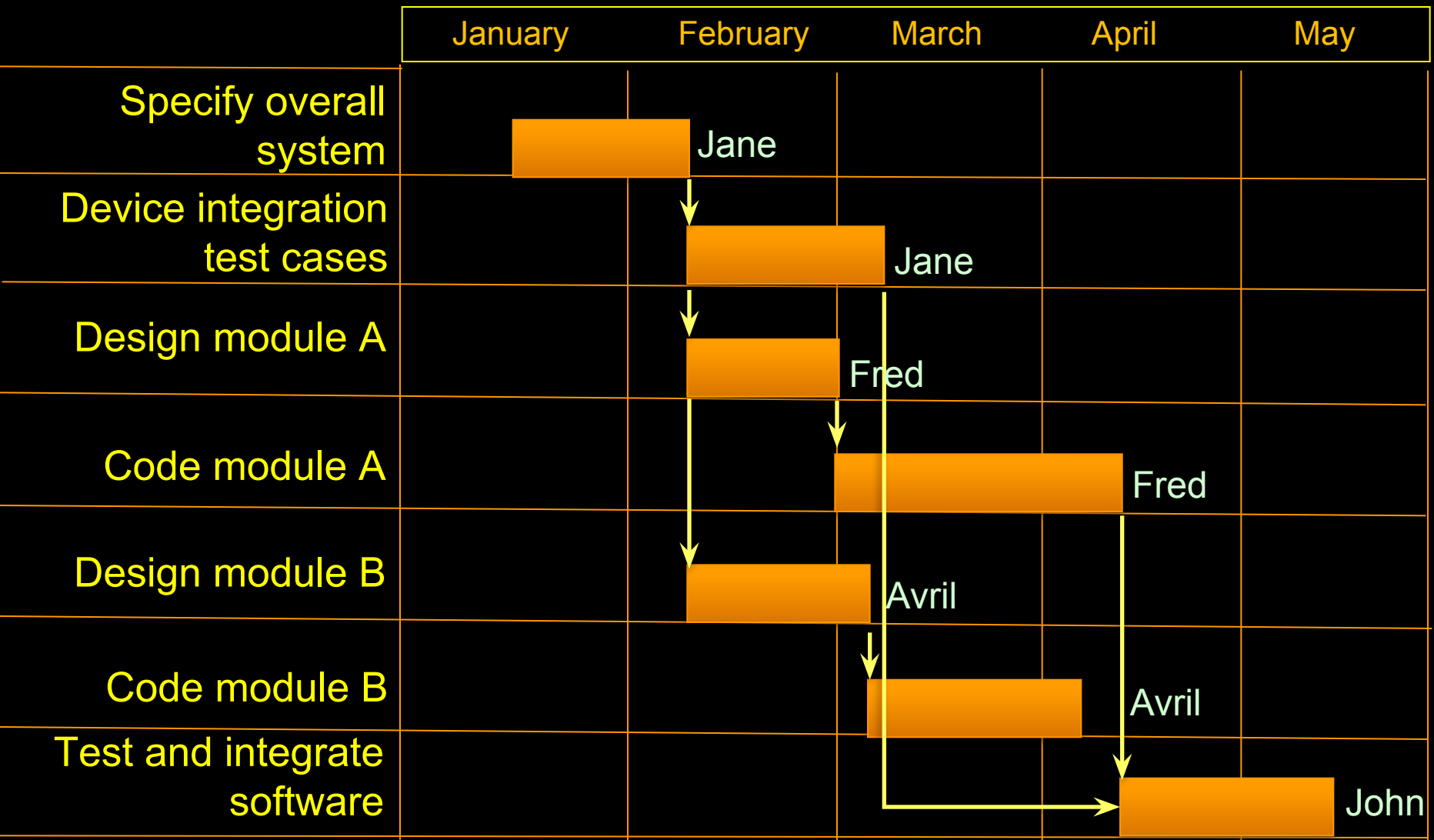
Calculate volumes

Systems assistant

Draft and issue ITT

Business
analyst

Gantt chart showing the staff will carry out tasks



Step 8: Review/publicize plan

8.1 Review quality aspects of project plan

(ensure the quality criteria has been ensured before completion of the project)

8.2 Document plan and obtain agreement

Step 9 and 10: Execute plan and create lower level plans

Key points

Establish your objectives

Think about the characteristics of the project

Discover/set up the infrastructure to support the project (including standards)

Identify **products** to be created and the **activities** that will create them

Allocate resources

Set up quality processes