Project Management: An Introduction based on Cadle and Yeates (2008)
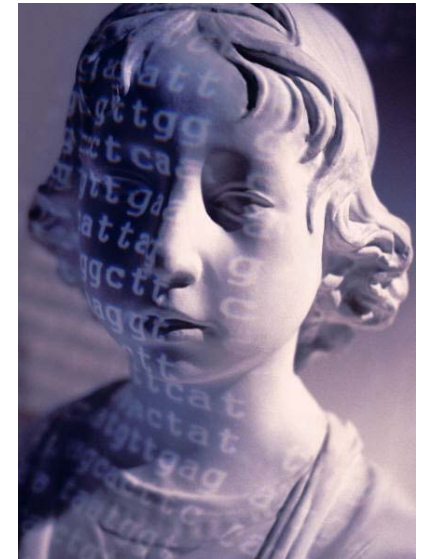
Bendik Bygstad, NITH

IFI, 10.sept 2010
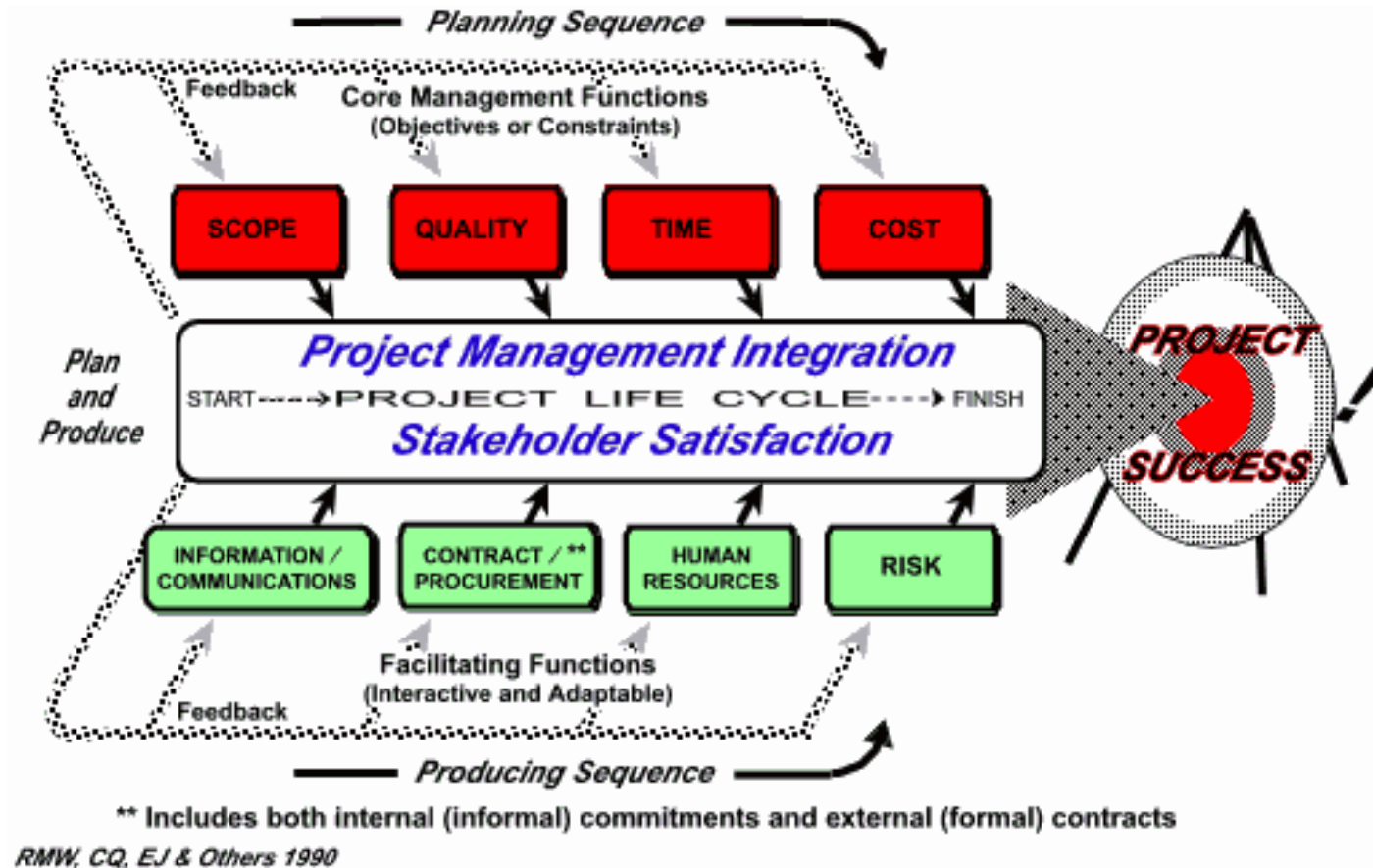
Two Faces of Project Managemement

Normative	Critical
PMI, CMM Turner, Paulk, Cadle&Yeates	Alternative perspectives, Fitzgerald, Ciborra, Hanseth
Methods and control	Theories and paradoxes
Main evidence: Statistics	Main evidence: Cases
Focus on planning and control	Focus on human and social aspects

The Normative Approach: PMI


Project Management Institute

Cadle & Yeates: Project Management for Information Systems

- Standard text book

- Practice based and practice oriented

- Includes:

  - Hard topics: Goals, WBS, estimation, schedule, control, risk management, quality

  - Soft topics: Organisational issues, people issues, management

  - New topics: Change management, value engineering

Cadle & Yeates: Overview

- What is a project? Chapter 4
- Development approaches. Chapter 6
- Project planning . Chapter 8
- Scheduling and resourcing. Chapter 10
- Monitoring progress. Chapter 11. (See Earned value)
- Delivering success: Managing change. Chapter 20
- Delivering success: Value management. Chapter 16

Earned value
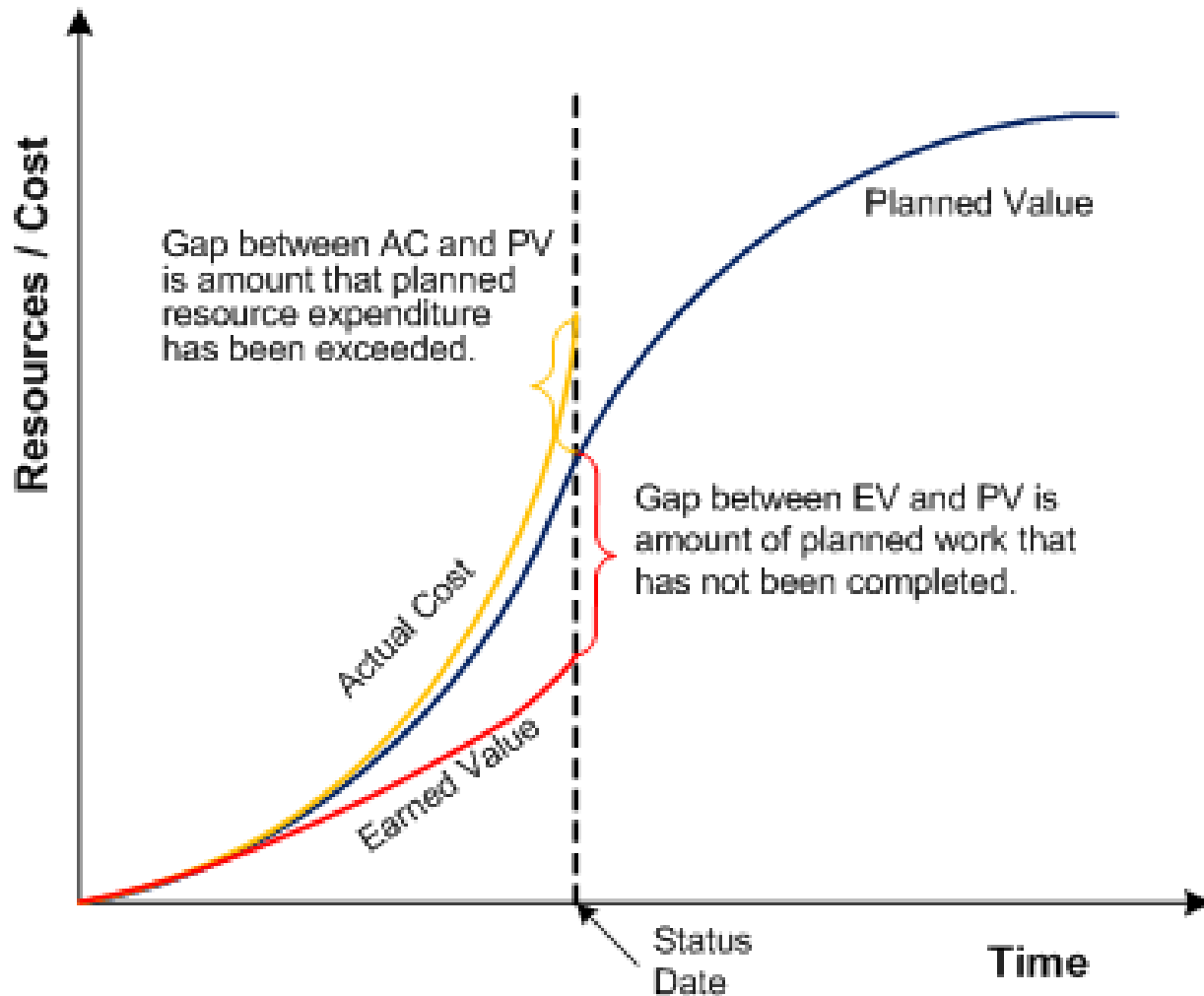
Foiler fra Cadle & Yeates

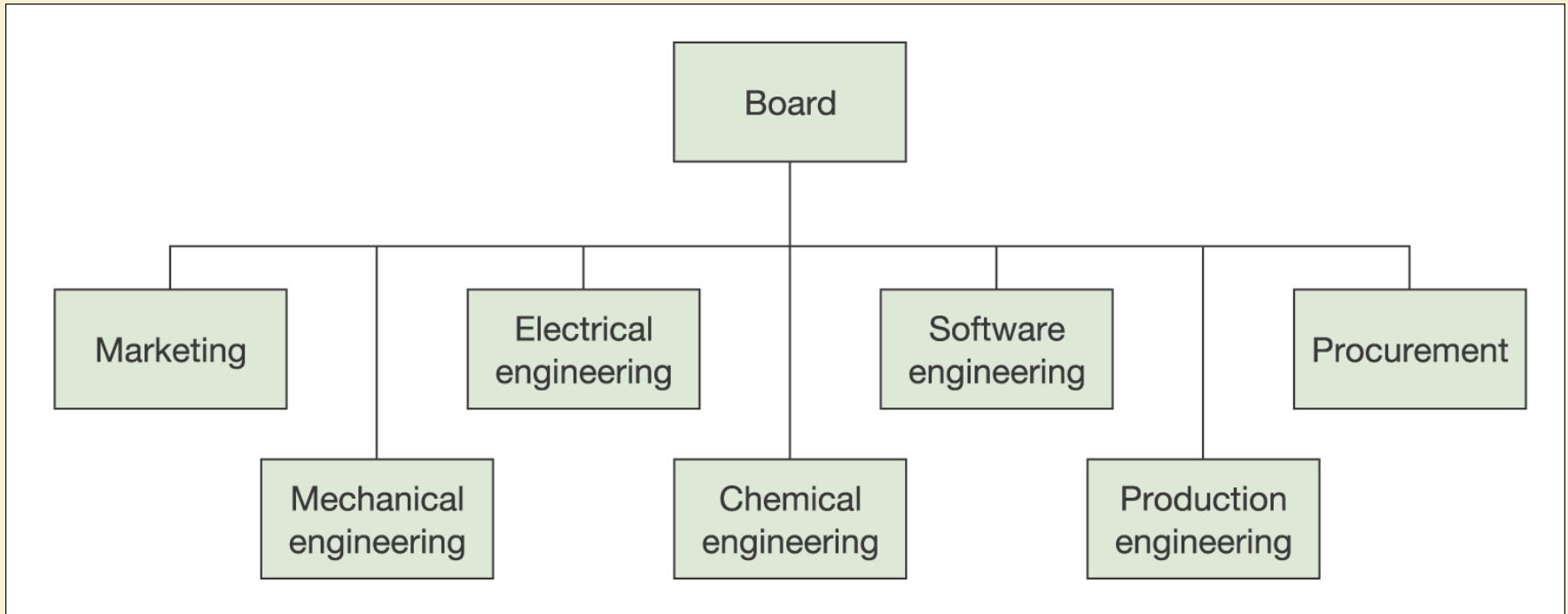# Functional organization

Figure 4.1 Functional organization structure
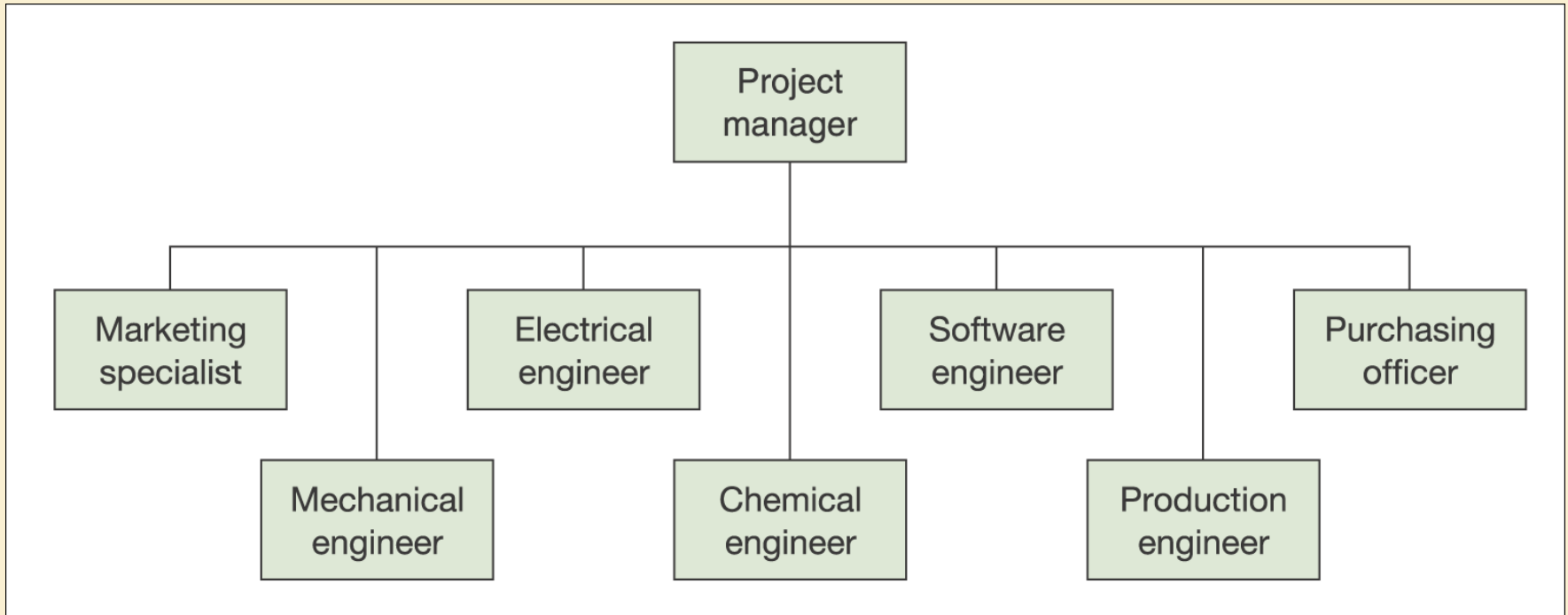
'Pure' project structure

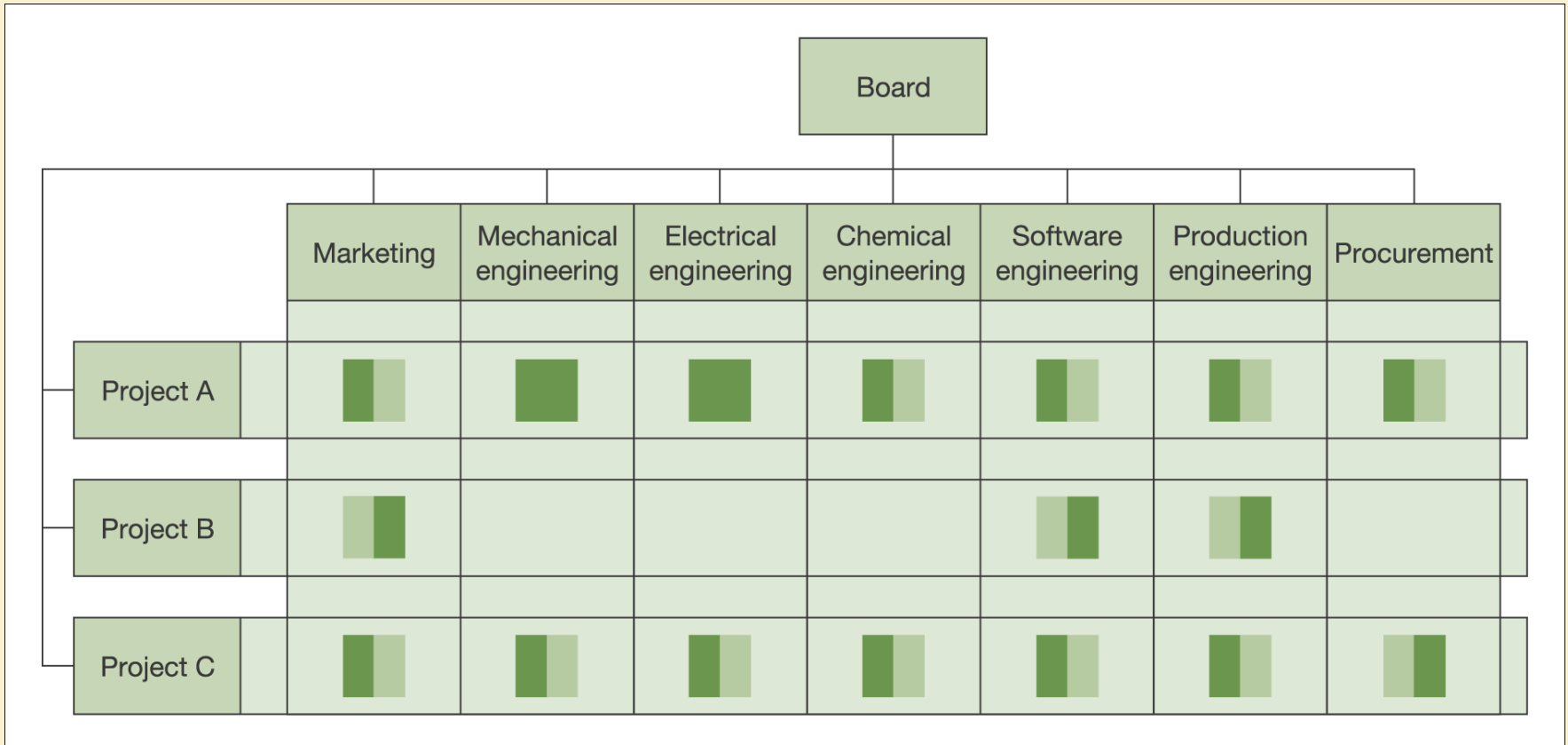Figure 4.2 'Pure' project structure

Matrix structure

Figure 4.3 Matrix structure

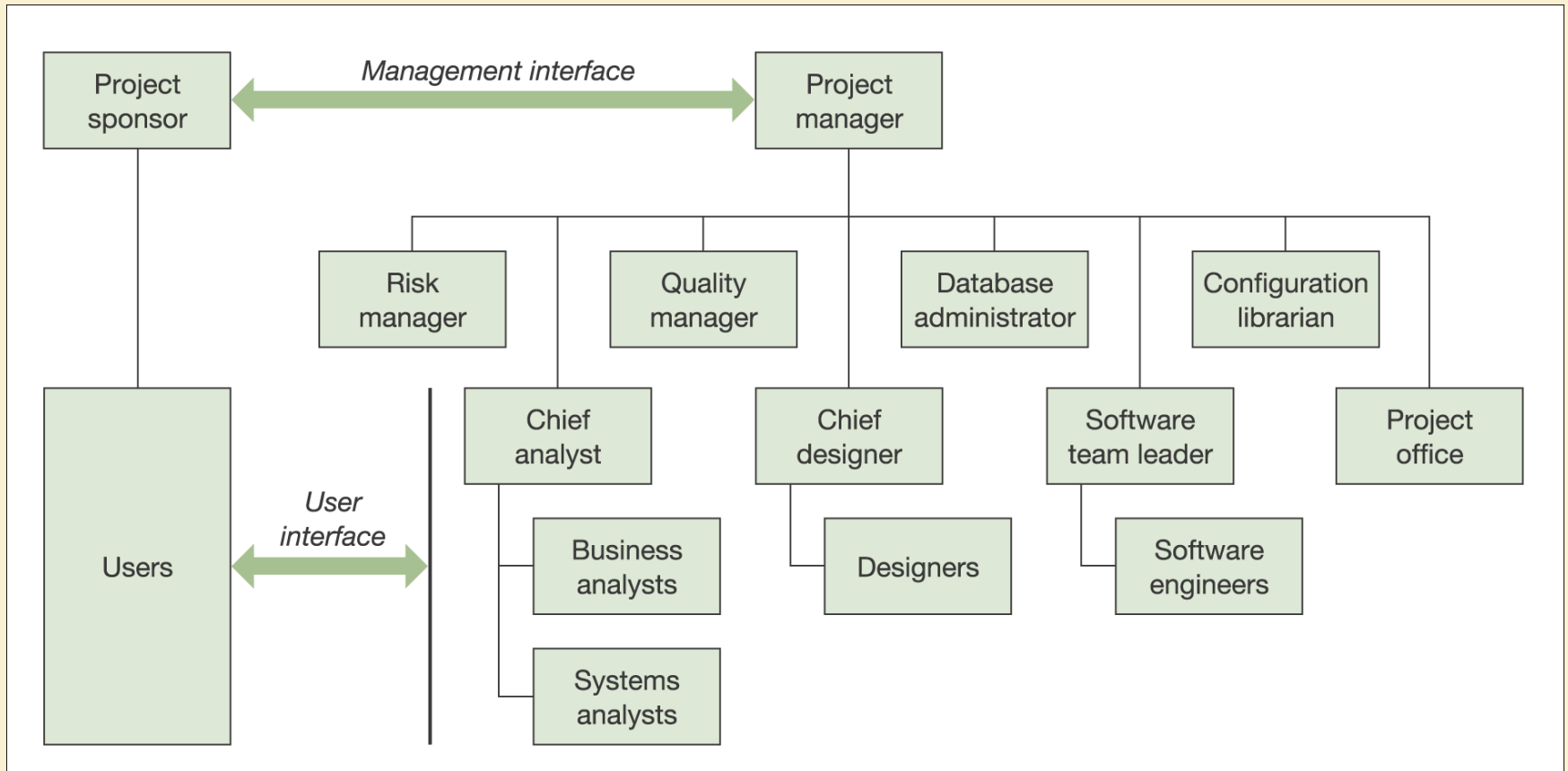# Generic project organization

Figure 4.4 Generic project organization and roles

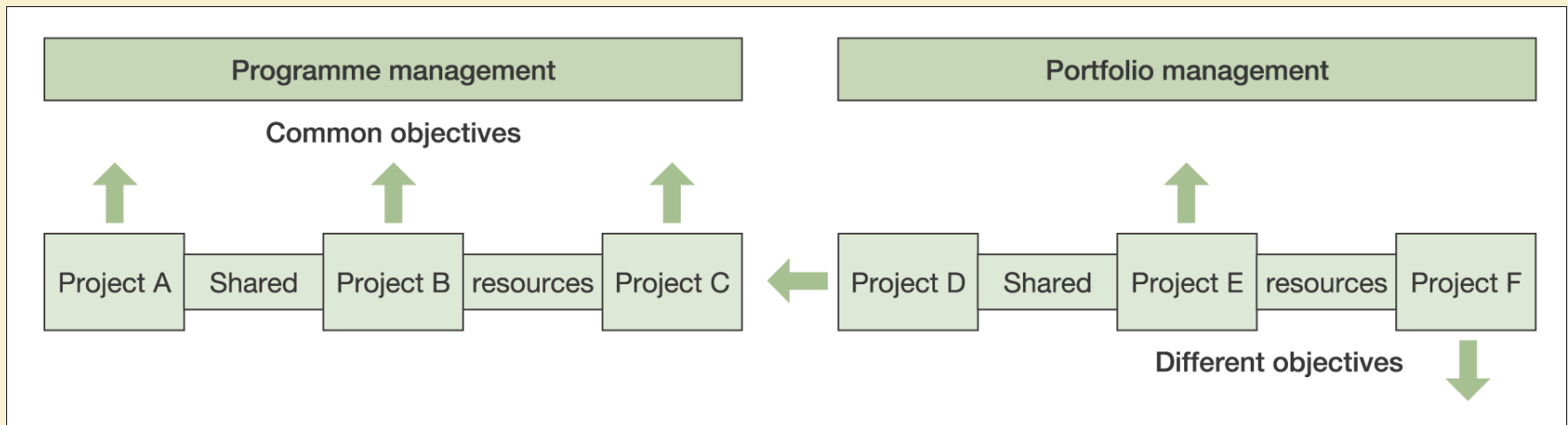# Programme and portfolio management

Figure 4.5   Programme and portfolio management
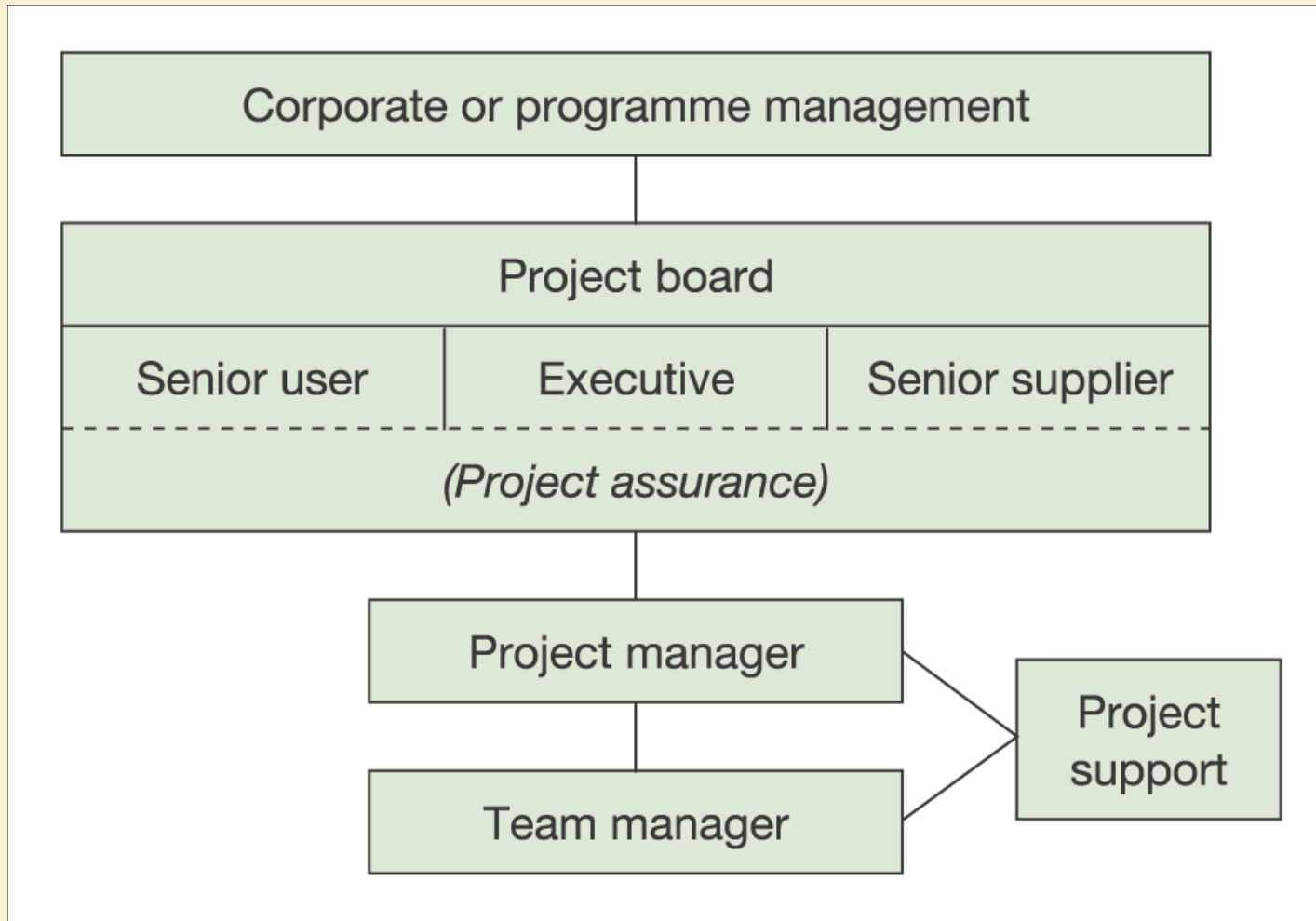
PRINCE2® organization structure

Figure 4.6   PRINCE2® organization structure

Key issues for managing change

- Plan the change programme in the same way as the IT development.

- Consider impact of change on users.

- Phase introduction of change.

- Involve users in planning and implementation.

Reasons for business change

- Business survival – time, often, a key factor here.

- Improved efficiency – and provision of better information based on systems.

- Competitive advantage – through use of innovation.

- External factors – key is involvement of all stakeholders.

Time and change matrix

Type of change	Short-term (3–9 months)	Long-term (1 year +)
Radical	Restructuring and redeployment of staff	Business process re-engineering
Incremental	Process automation and refinement	TQM, innovation schemes

Figure 20.1 Time and change matrix
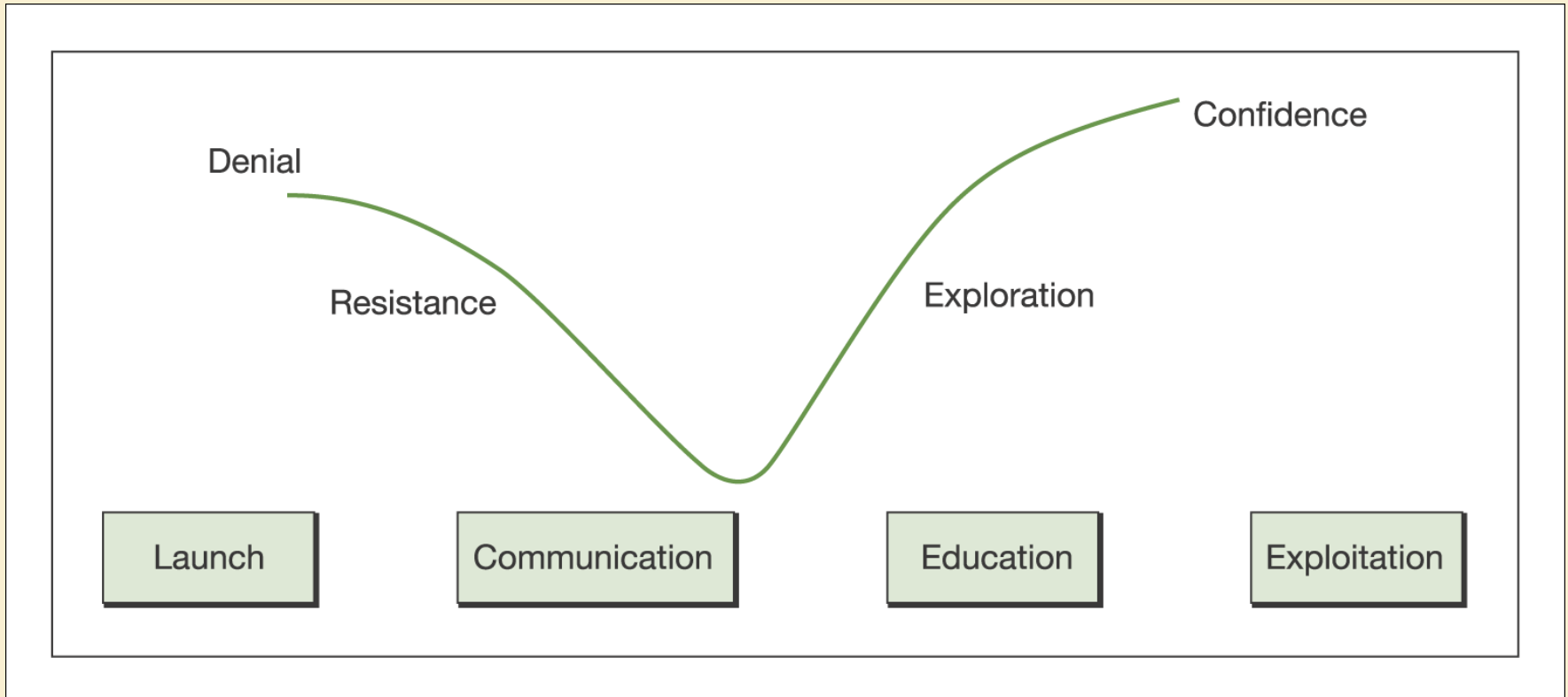
The phases of change

Figure 20.2 The phases of change

Organizational cultures

- Power-based culture:
  - Centralized and informal
  - Get and demonstrate sponsorship.

- Bureaucratic culture:
  - Centralized and formal
  - Play by the rules and use your network.

- Task-based culture:
  - Devolved and formal
  - Regular use of project teams and task forces.

- Individualistic culture:
  - Devolved and informal
  - Everyone has an opinion – consensus needed.

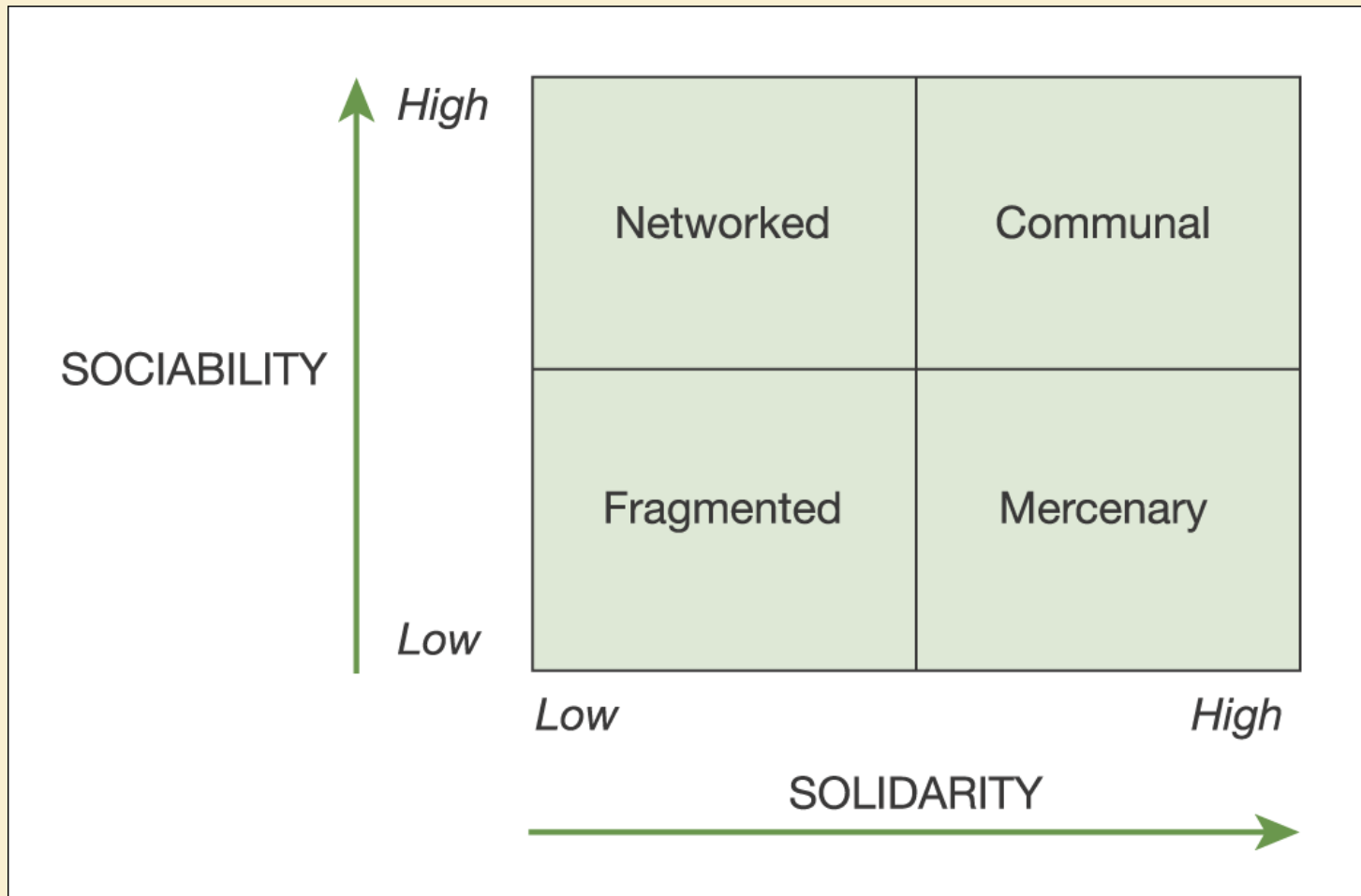# Sociability/solidarity matrix

Figure 20.4   Sociability/solidarity matrix

Source: Based on Rob Goffee and Gareth Jones, *The Character of a Corporation*, 2nd edition, Profile Books, 2003

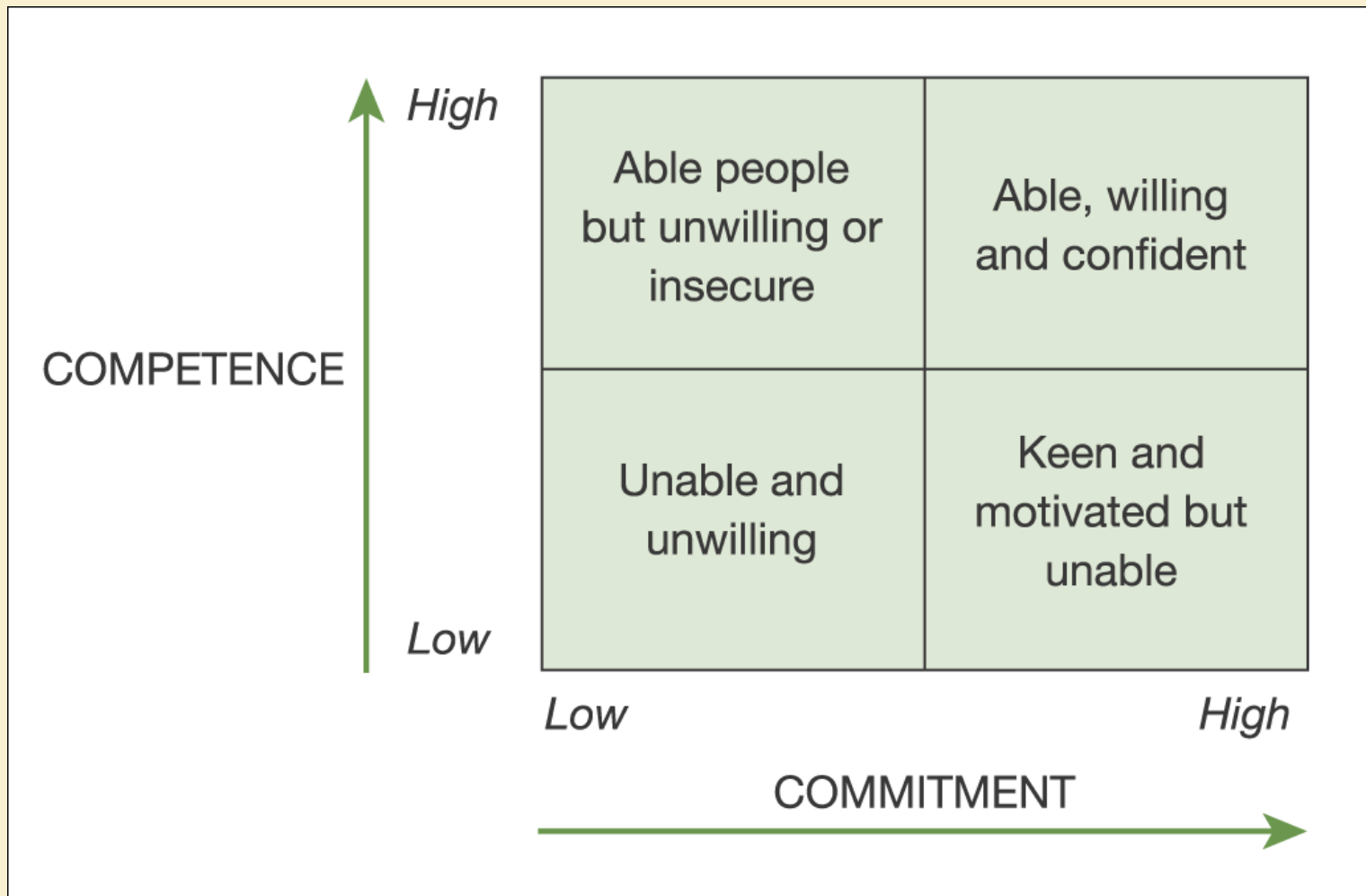# Change competence/commitment matrix

Figure 20.5 The change competence/commitment matrix
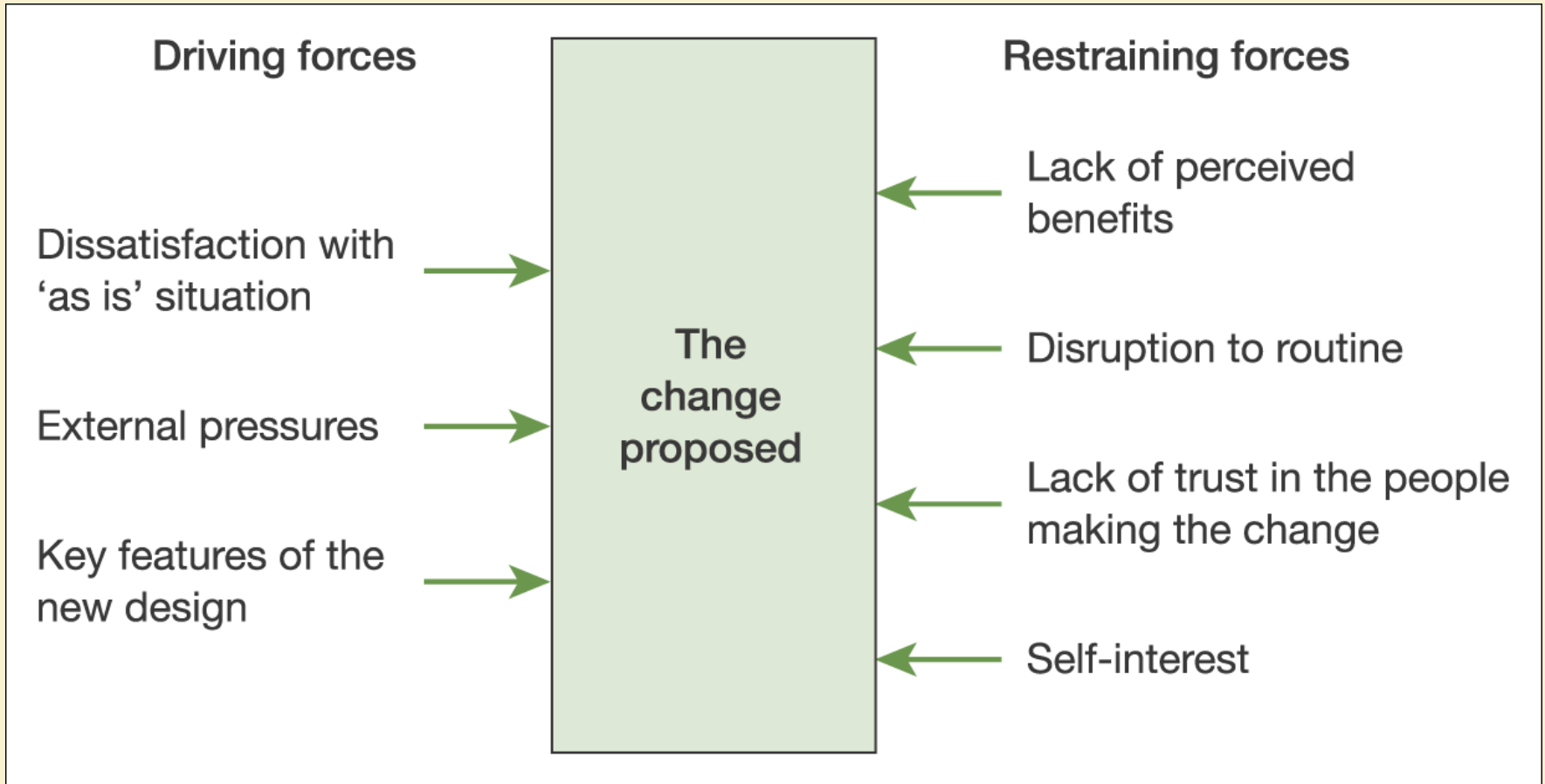
Force-field analysis

Figure 20.6 Force-field analysis

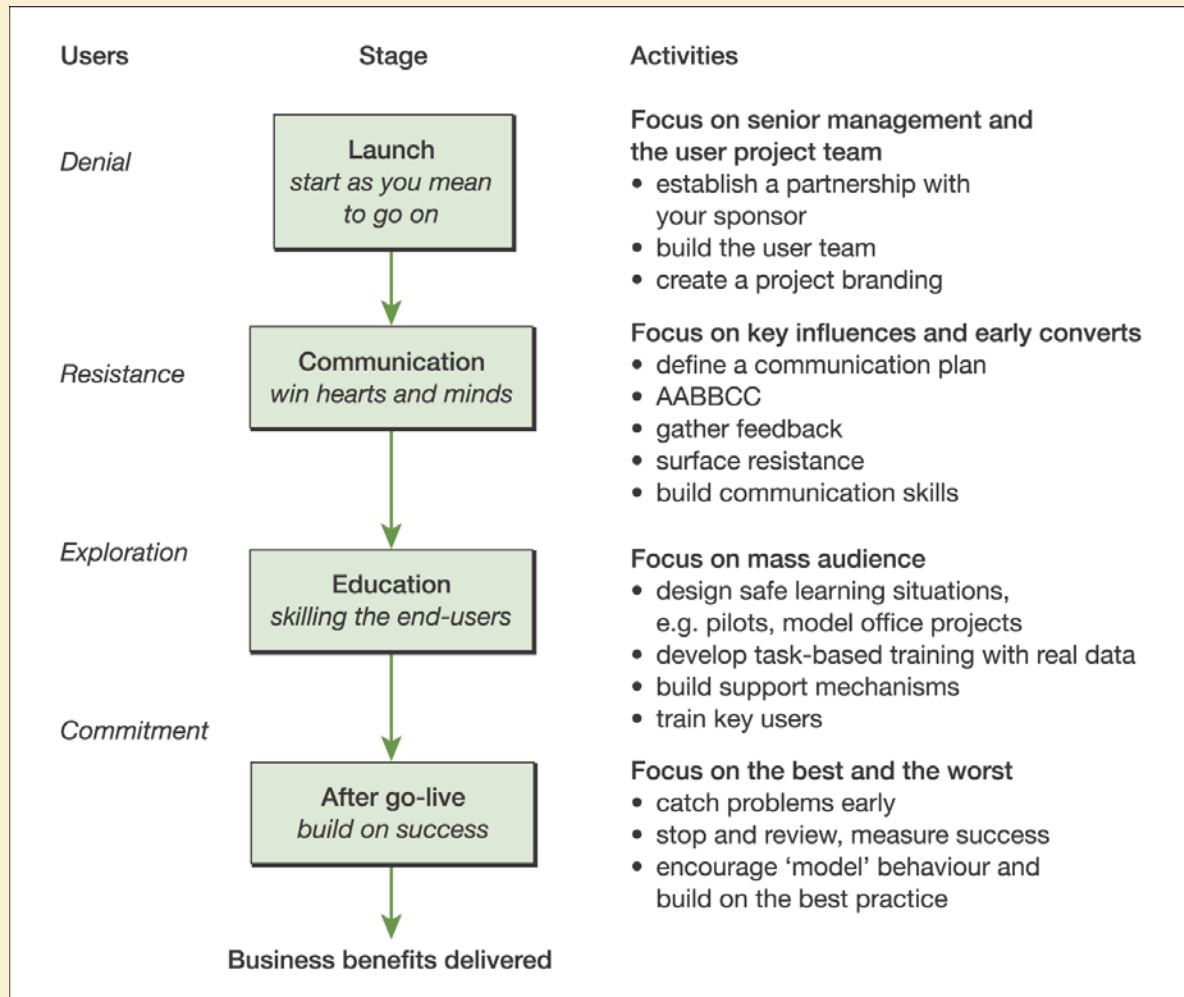# Four-phase model for business change

Figure 20.7 Four-phase model of managing business change

System development lifecycle – waterfall model
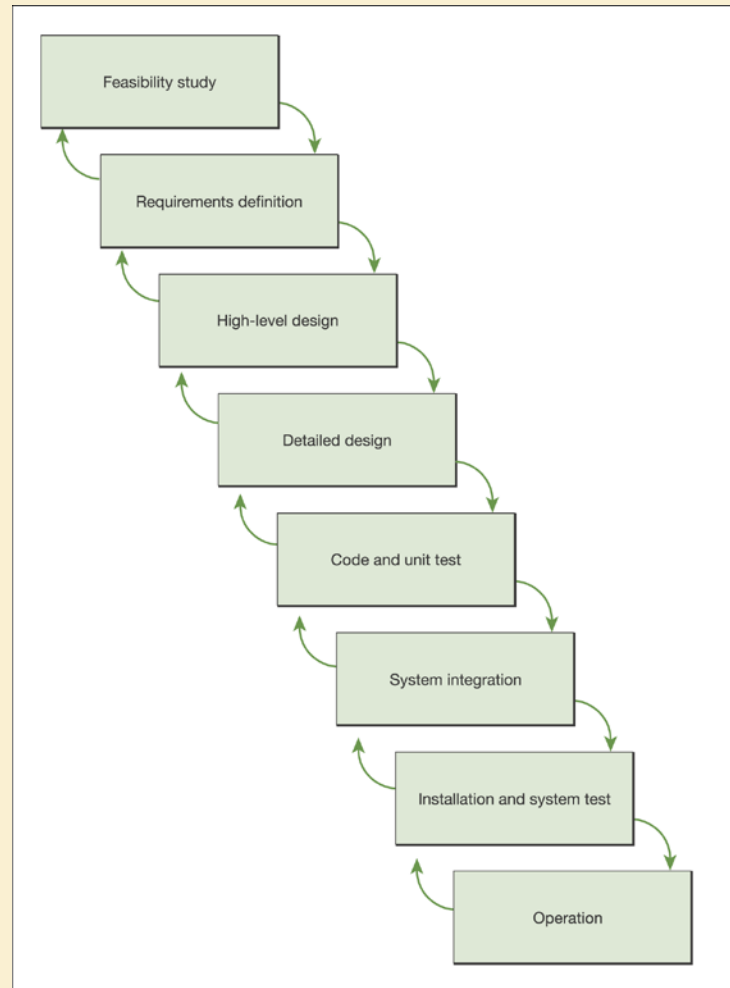
Figure 6.1 The waterfall model of system development lifecycle

The 'b' model
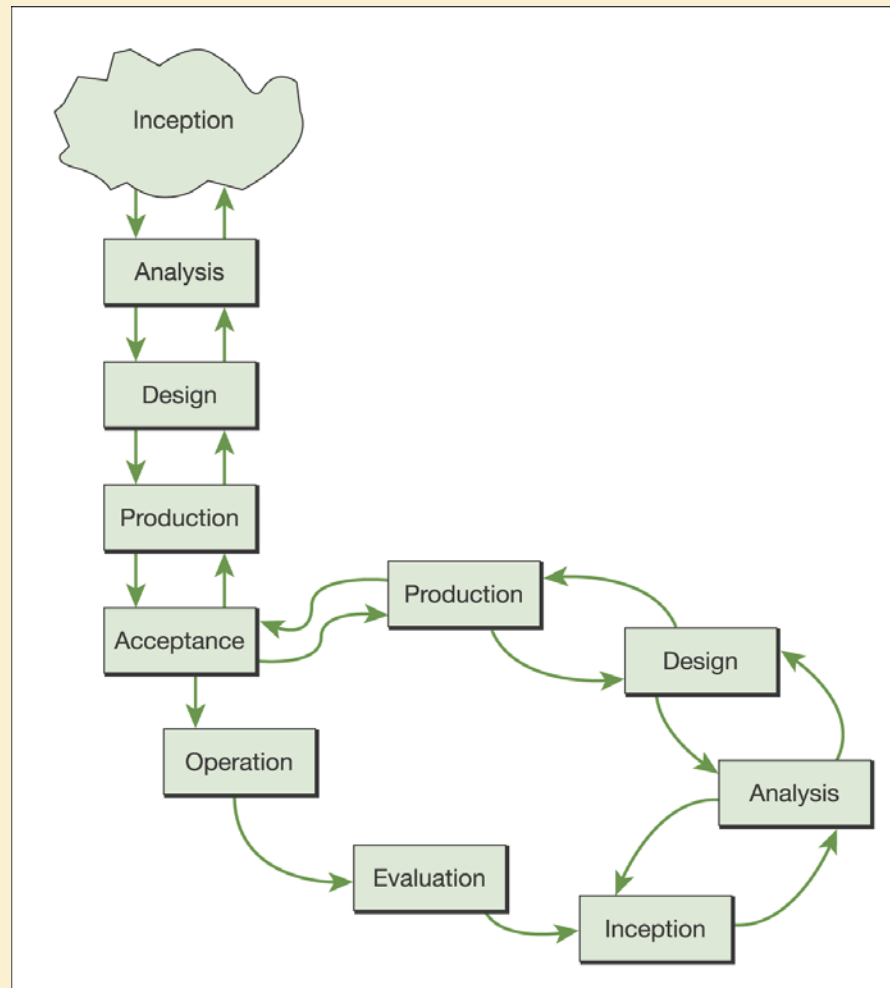
Figure 6.2 The 'b' model

Source: N D Birrell and M A Ould, *A Practical Handbook for Software Development*, Cambridge University Press, 1985

The 'V' model
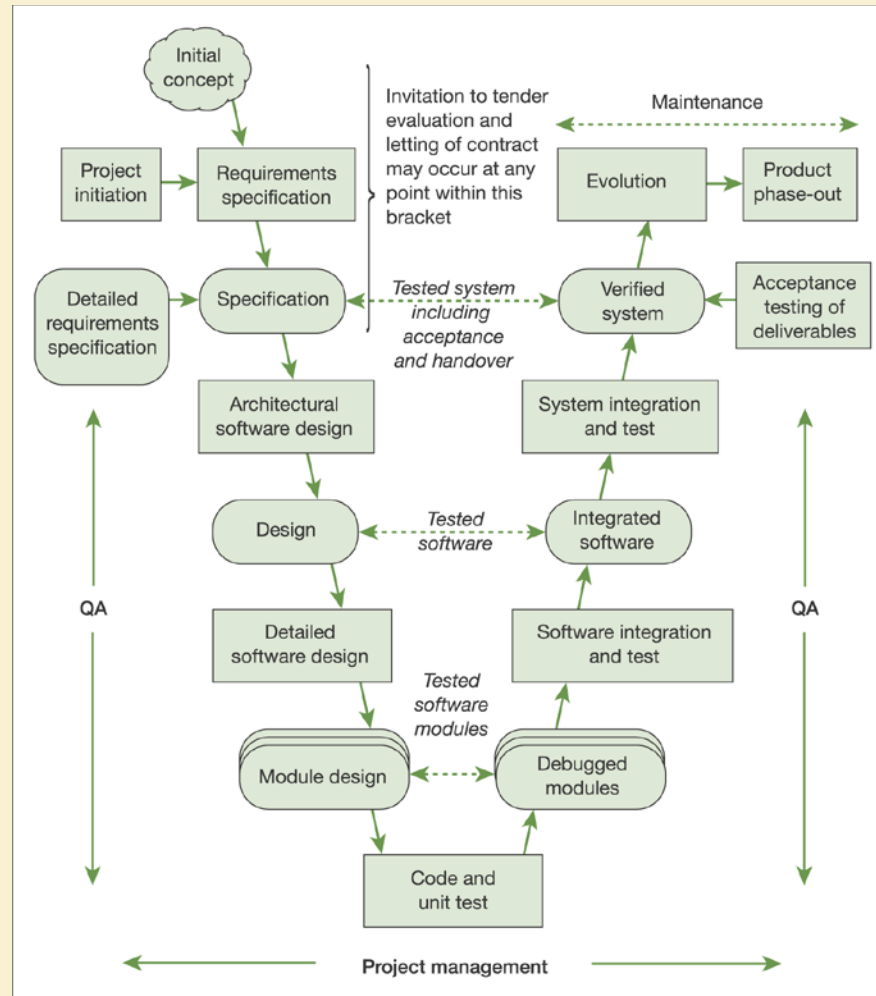
Figure 6.3 The 'V' model

Source: Reproduced with permission of the National Computing Centre Limited from the *STARTS Guide*, 1987, which was supported by the Department of Trade and Industry

The incremental approach
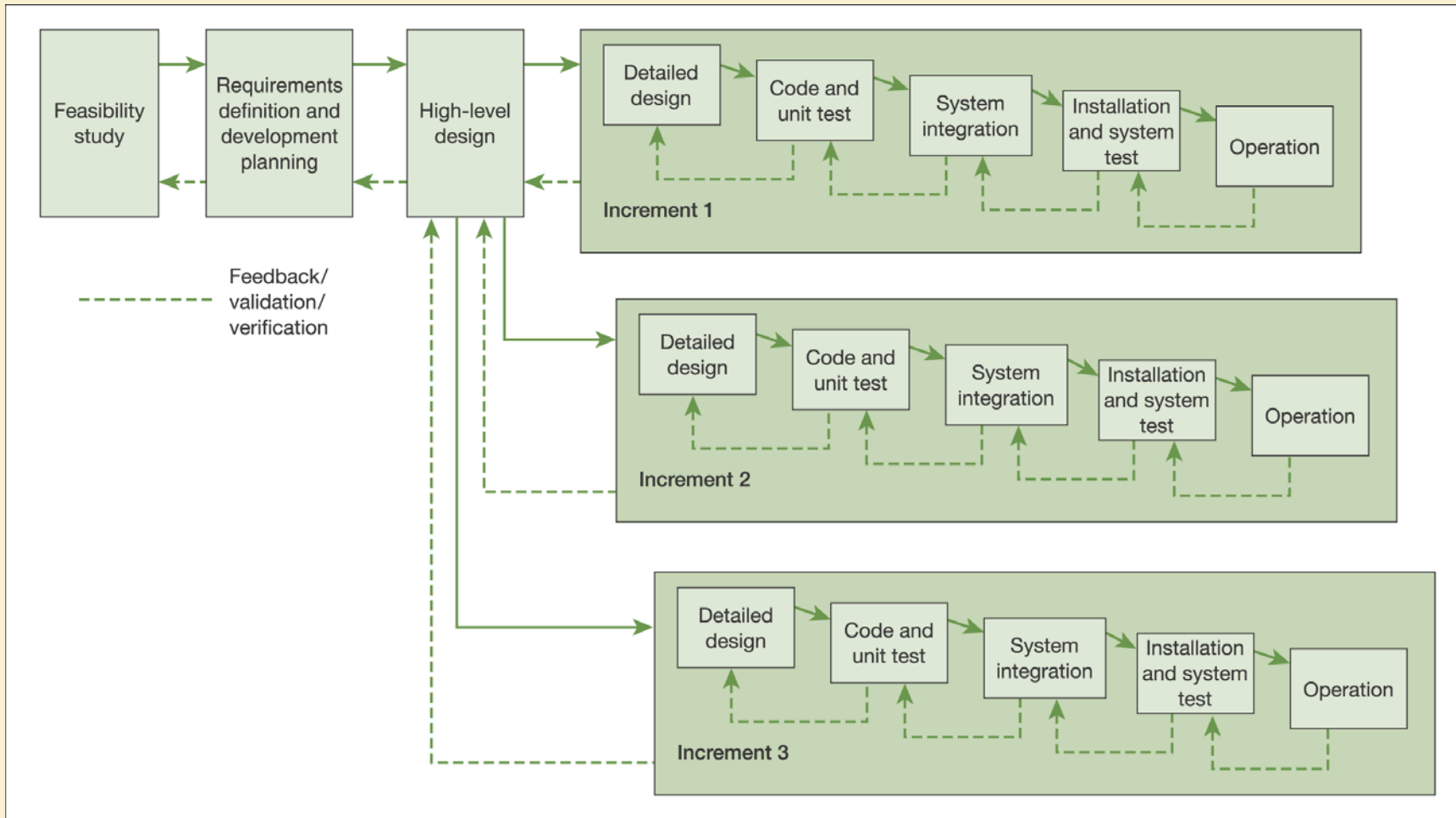
Figure 6.4 The incremental model

The spiral model – evolutionary development
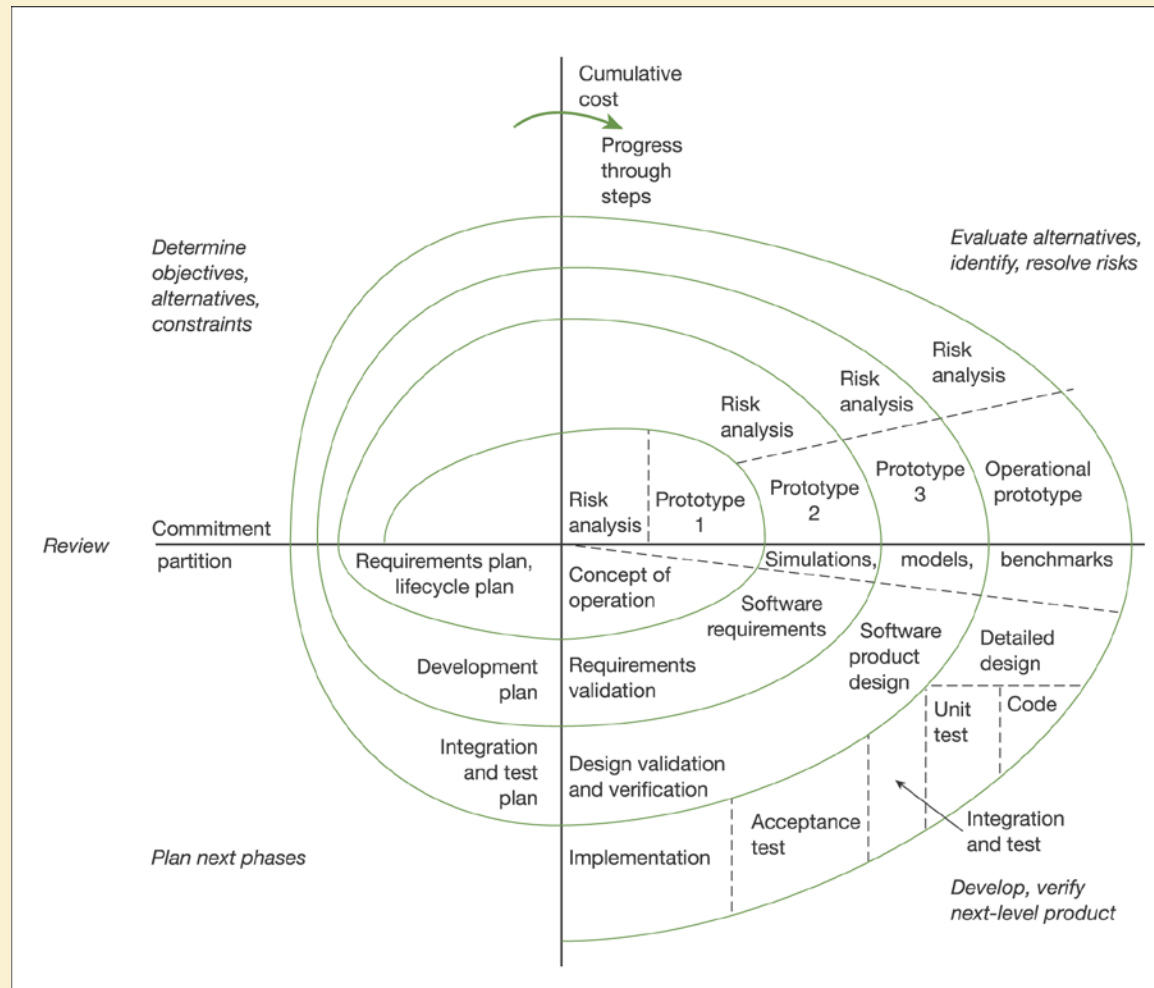
Figure 6.5 Boehm's spiral model

Source: © 1988 IEEE

Structured systems development
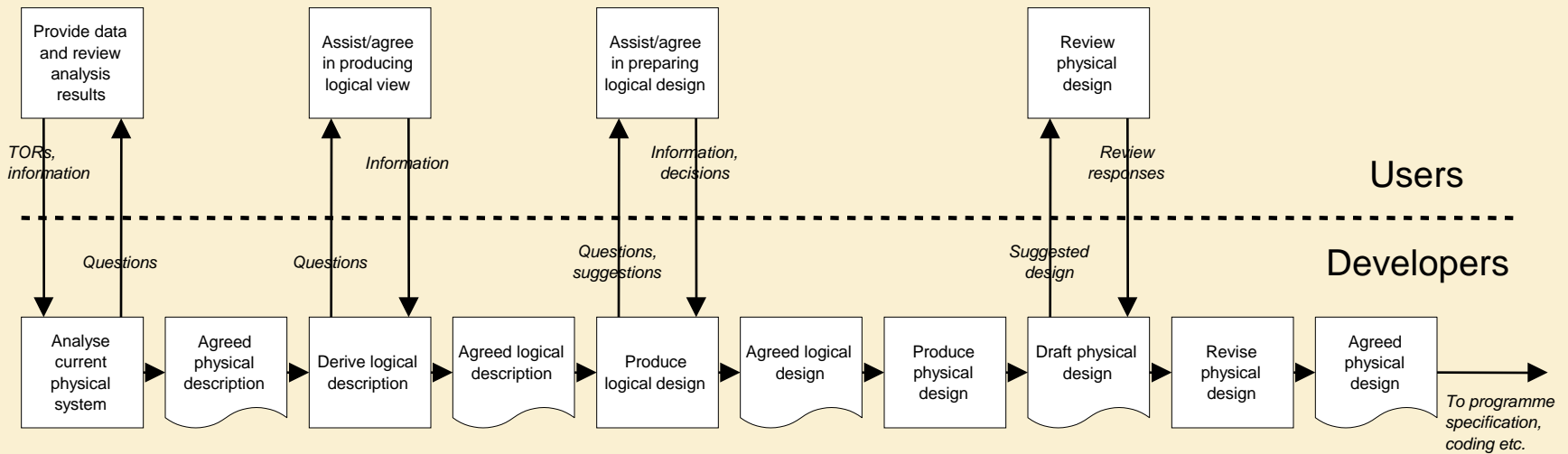
Greater user involvement at all stages; driven by users

Agile approaches – origins

- Addresses long-windedness of other approaches
- Prototyping used to:
  - assist users define requirements by demonstrating possibilities
  - investigate novel methods of working
  - test performance implications
  - assist in considering work practices

Agile approaches – features

- Success dependent on empowerment of users and developers
- Deliverables reviewed for business fitness
- Testing integral to iterative lifecycle
- All changes reversible
- Incremental/partial delivery acceptable
- 'Timeboxing' used to control timescale (and budget)
- Workshops widely used

Agile methods 1 – Scrum

- Scrum.

- Origins in USA.

- Scrum is daily meeting to review progress and reset priorities.

- Development done in 30-day 'Sprints'.

- Every aspect of the project time-boxed.

- Project manager is 'ScrumMaster' – different from the usual PM role – teams self-governing.

Agile methods 2 - DSDM

- Eight principles:
    1. Focus on business need.
    2. Deliver on time.
    3. Collaborate.
    4. Never compromise quality.
    5. Develop solution iteratively.
    6. Build incrementally from firm foundations.
    7. Communicate continuously and clearly.
    8. Demonstrate control.

Object-oriented development

- Object is a package of software containing:
  - 'variables' (data).
  - 'methods' (processes)
- Objects communicate via messages.
- System is built up from intercommunicating objects.
- Deals with problem of integration of large systems.

UML and Unified Process

- Unified Modeling Language provides visual language for OO projects.

- Unified Process provides process model.

- Approach 'open' (non-proprietary) but Rational Corporation offers Rational Unified Process.

- Four phases to process:
  - Inception
  - Elaboration
  - Construction
  - Transition.

Component-based development

- Development of reusable components

- Aim – to create libraries of components that can be combined to build new systems

- Long-term benefits – reduce development costs and produce more reliable systems

- Short-term costs often higher – because of need to consider wider usage of components

Extreme programming

- Created to deal with rapidly changing requirements
- Works best on relatively small projects
- Or on enhancements to existing systems
- Developers work in pairs
- Testing – integral part of process
- Emphasis on frequent releases of small-scale packages of software

Package-based IS projects

- Quicker and cheaper to buy commercial off-the-shelf (COTS) solution than build from scratch.

- Two main types of project:
  - Package-constrained – users adapt to what package can do.
  - Package-based – package tailored to users' exact needs.

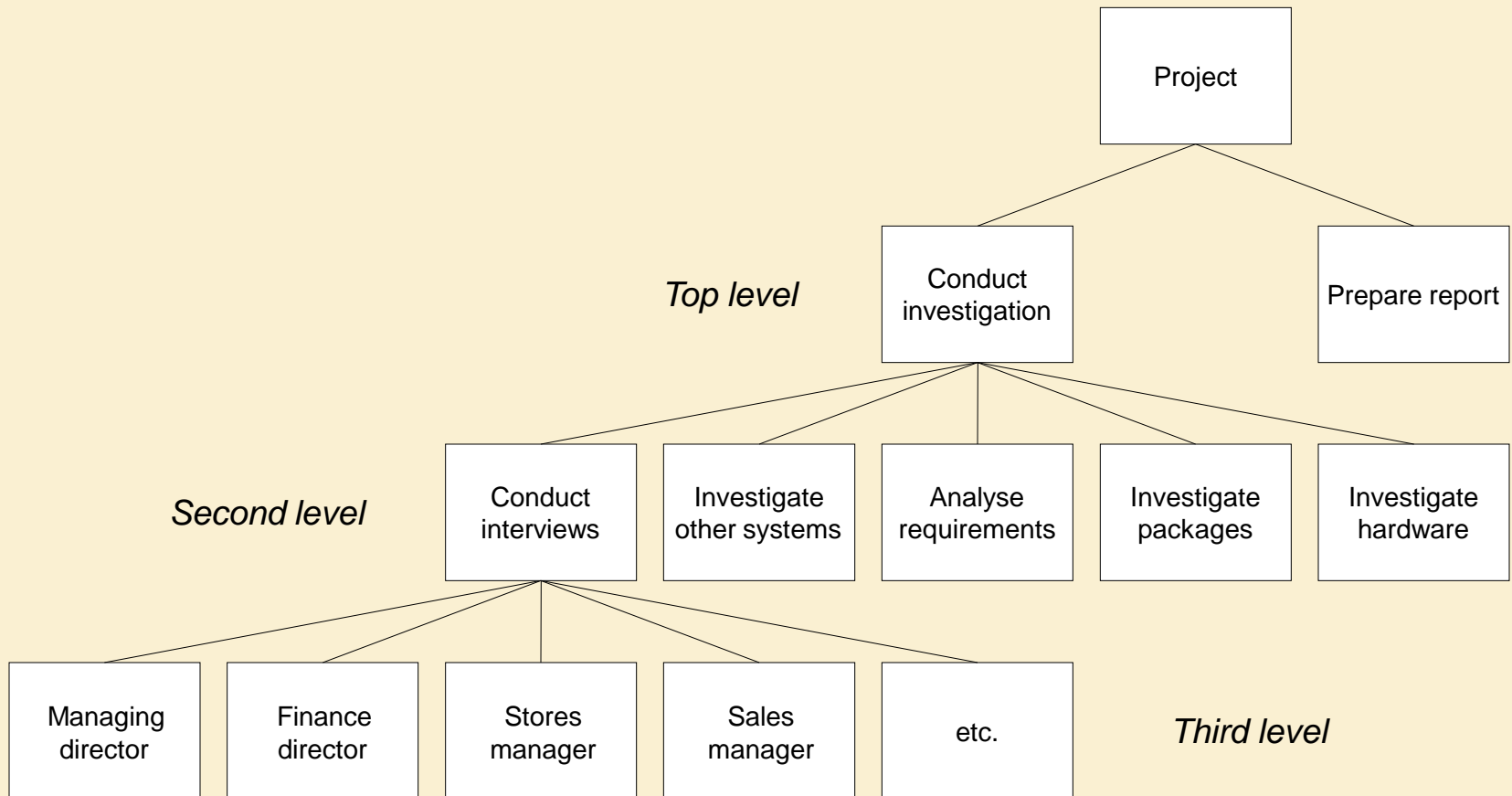- Extensive tailoring probably more expensive than bespoke development.

Soft systems and the Socio-Technical Approach

- Not really an IT development method

- But does consider a wider 'human activity system' (business system) of which IT is a part

- Recognizes that real-world problems rarely black and white
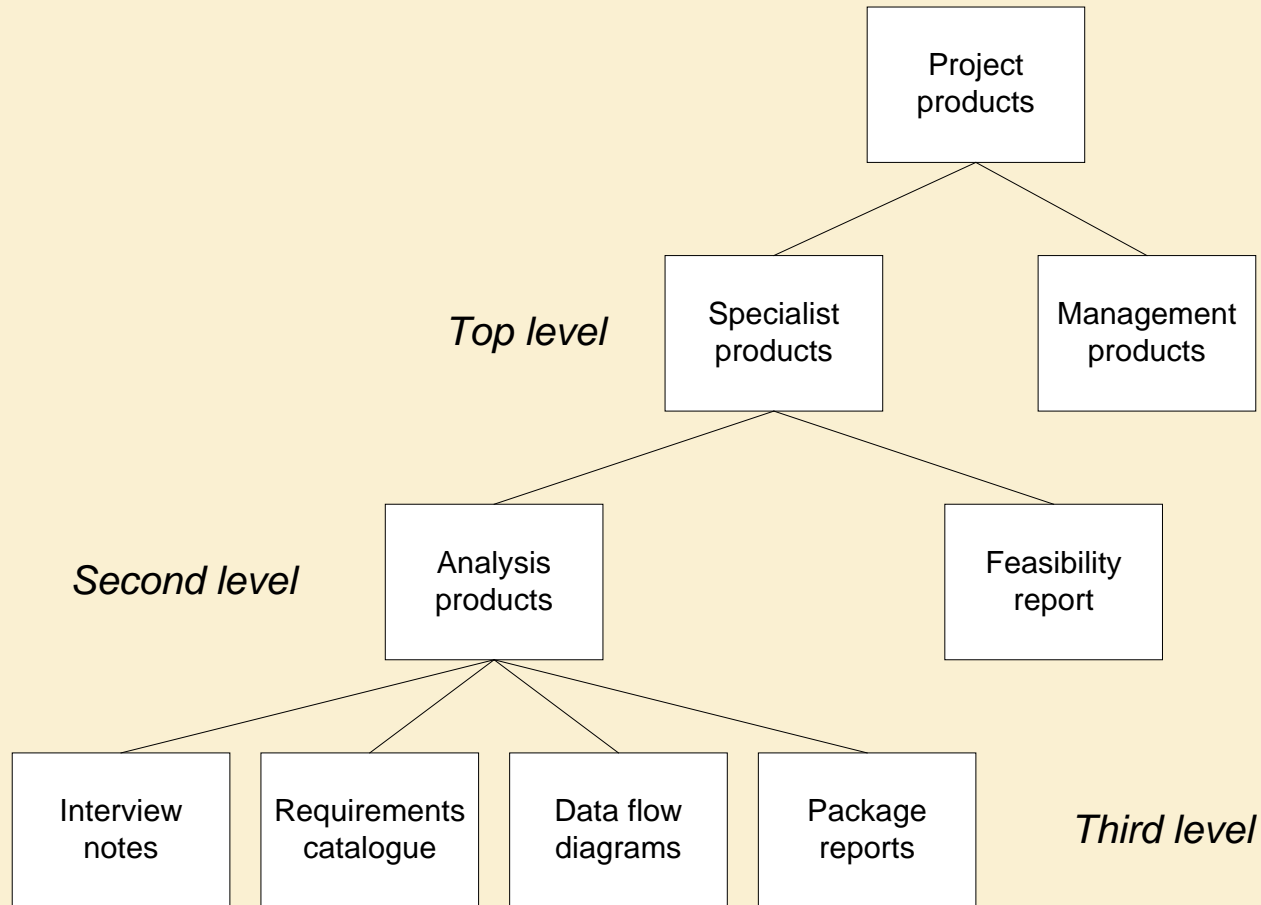
Business process re-engineering

- Originated by US consultants Michael Hammer and James Champy.

- Involves going back to first principles and re-designing optimal business systems.

- Leads to radical changes to organizations and fundamental changes to processes.

- High reward – but high risk also.

Work breakdown structure (WBS)

Top level — Project
- Conduct investigation
- Prepare report

Second level (under Conduct investigation)
- Conduct interviews
- Investigate other systems
- Analyse requirements
- Investigate packages
- Investigate hardware

Third level (under Conduct interviews)
- Managing director
- Finance director
- Stores manager
- Sales manager
- etc.

Figures 8.1–8.3 Work breakdown structures

Product breakdown structure (PBS)

Figures 8.5–8.8 Product breakdown structures
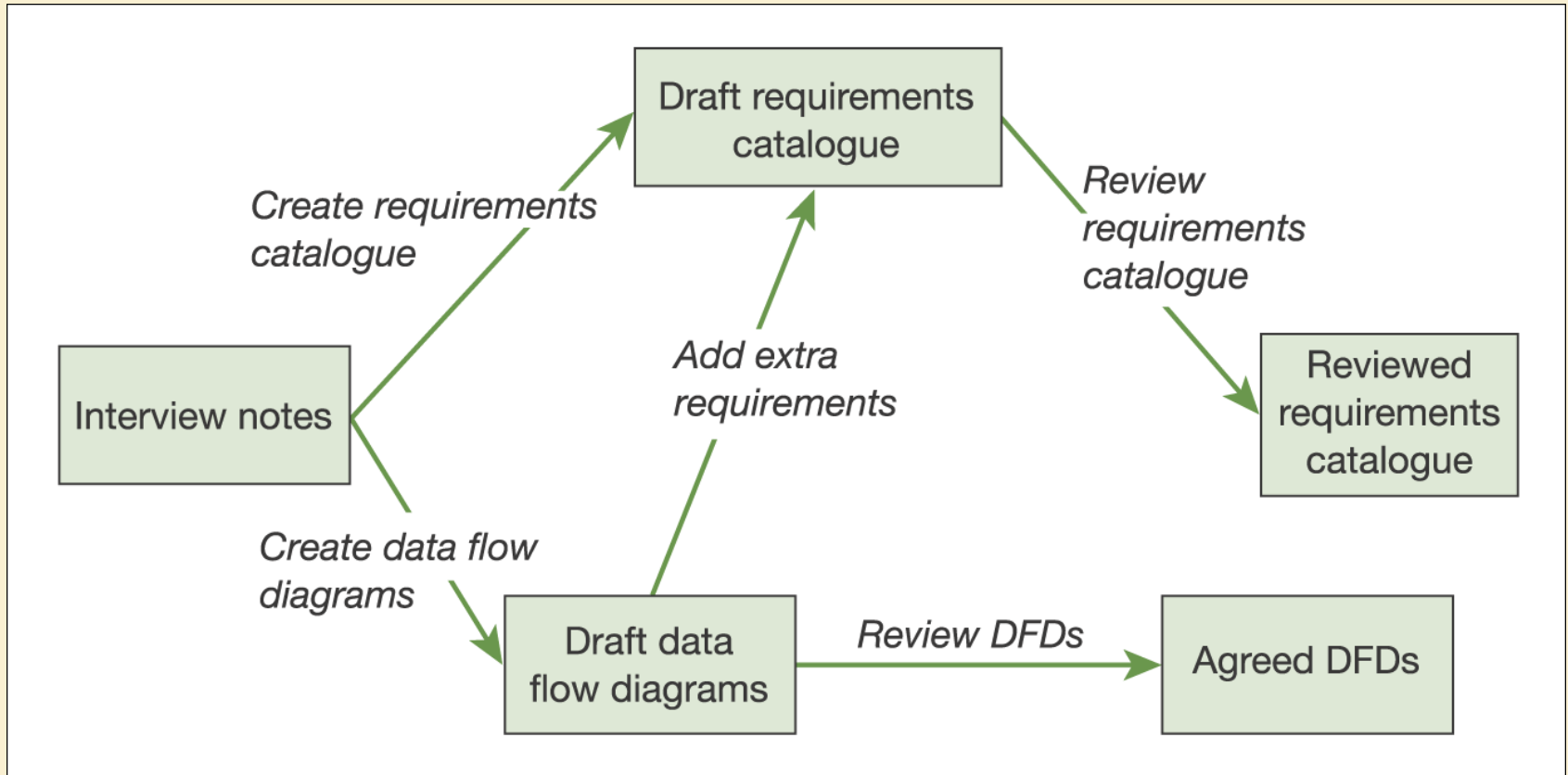
Product flow diagram (DFD)

Figure 8.9 PRINCE2® product flow diagram

Product description

- Purpose
- Composition
- Derivation
- Quality/completion criteria
- Can add:
  - Format
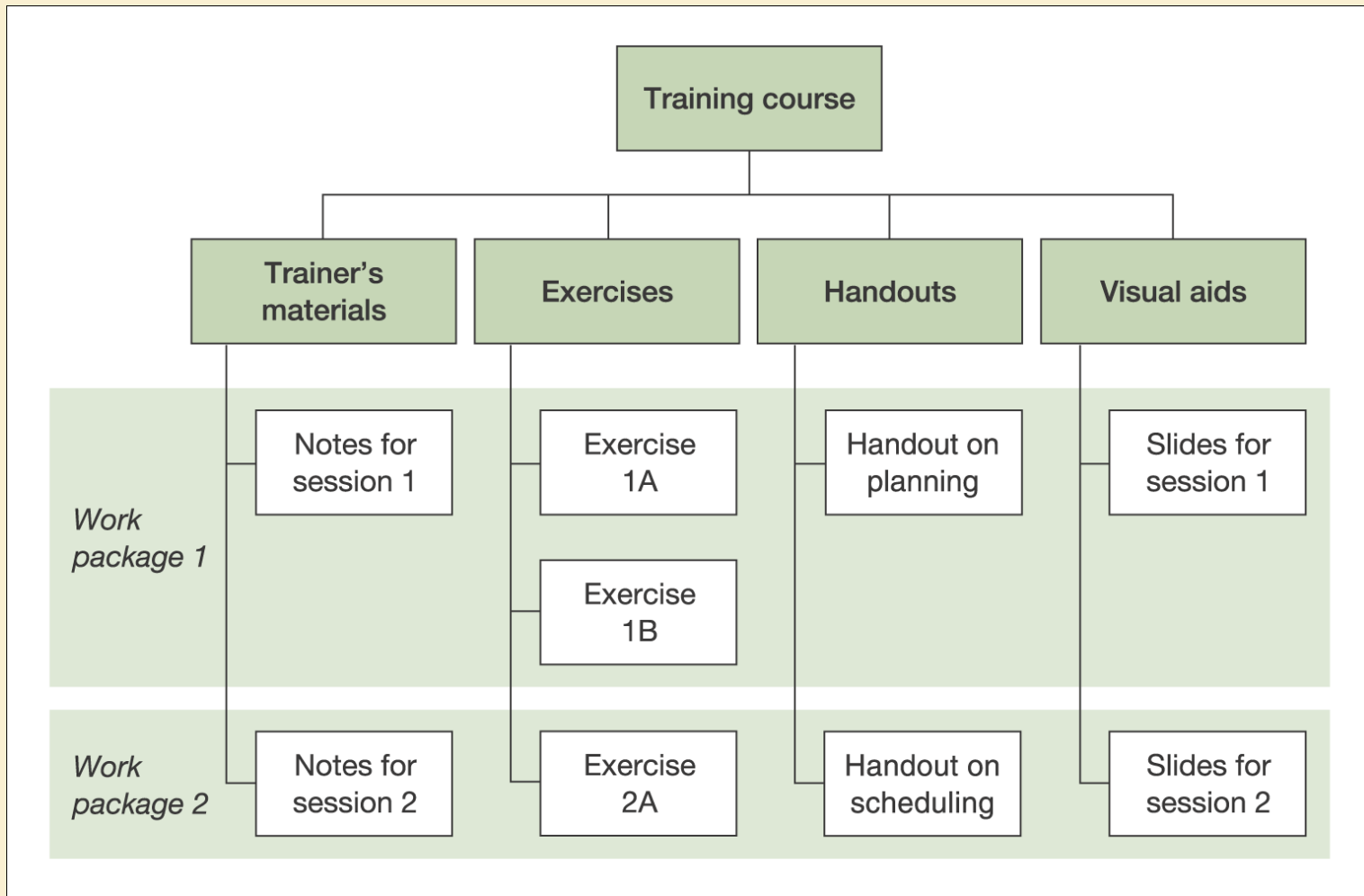 - Related products
  - Review methods.

Work packages

Linear responsibility chart

	Organization breakdown								OR, could use
R = Responsible A = Accountable C = Consultation I = Information	Project sponsor	Project manager	Analysis team leader	Chief designer	Development manager	Test manager	Project support assistant	Senior user	I = Initiation E = Execution A = Approval C = Consultation S = Supervision
Interview notes	I	A	R	I				C	
Requirements catalogue	I	A	R	I				C	
Use case diagram	I	A	R	I	I			C	
Package review	I	A	R	I	I	I		I	
Report text	I	A	R	I				I	
Report illustrations	I	A	R					I	
Report appendices	I	A	R	I				I	

Product/work package breakdown

Figure 8.11 Linear responsibility chart

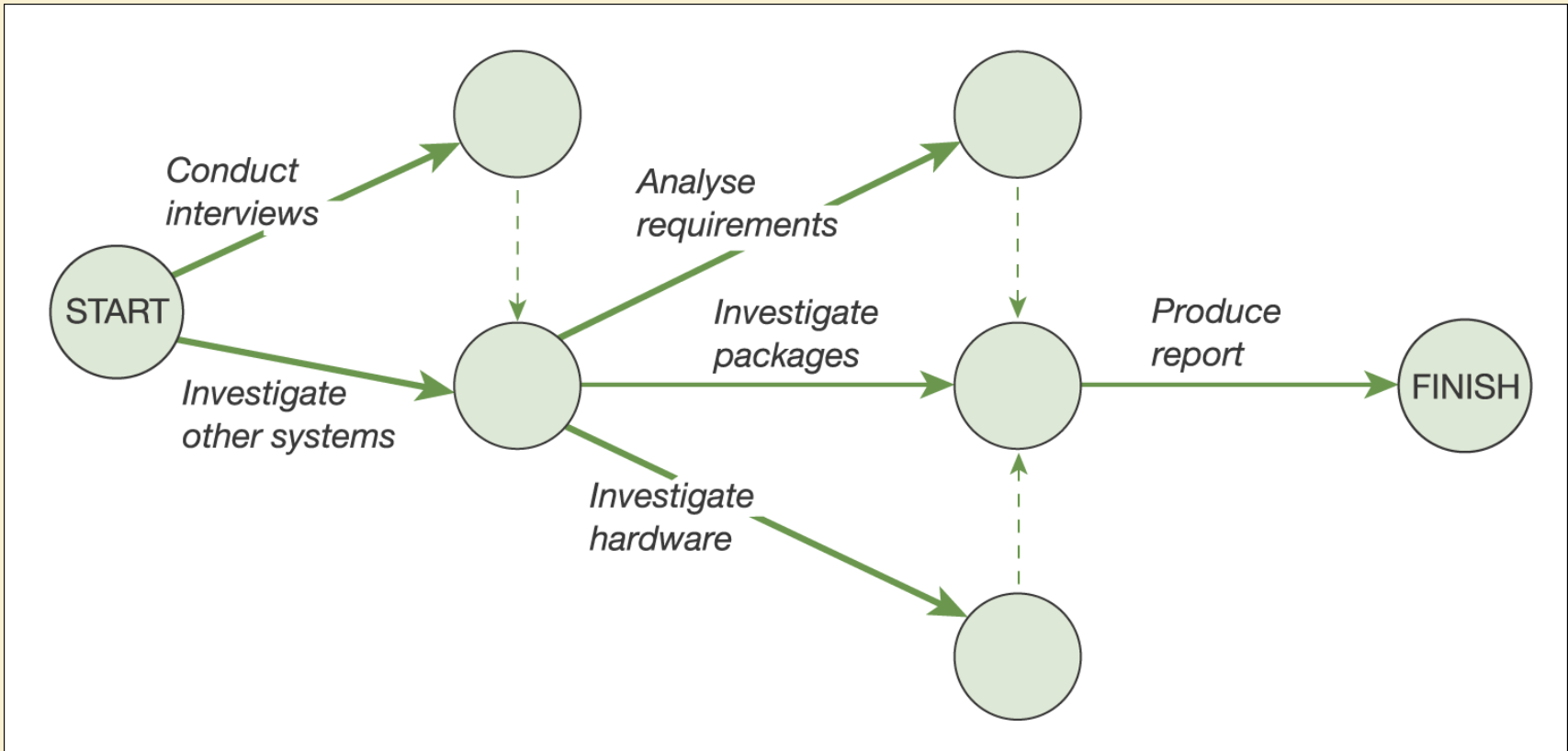# Network diagram (activity-on-arrow)

Figure 8.12 Network diagram (activity-on-arrow format)

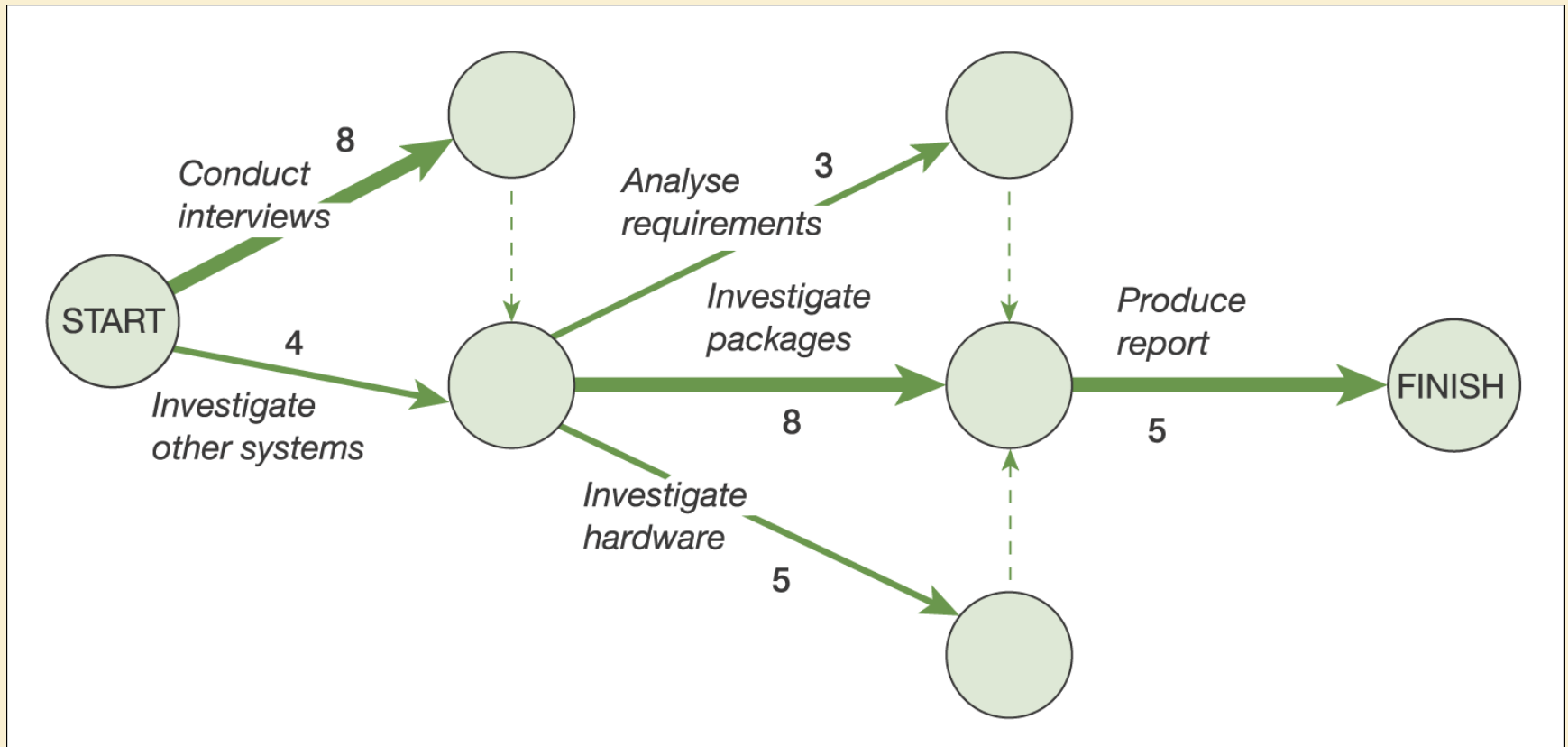# Network diagram with durations and critical path

Figure 8.13 Network diagram with durations and critical path added

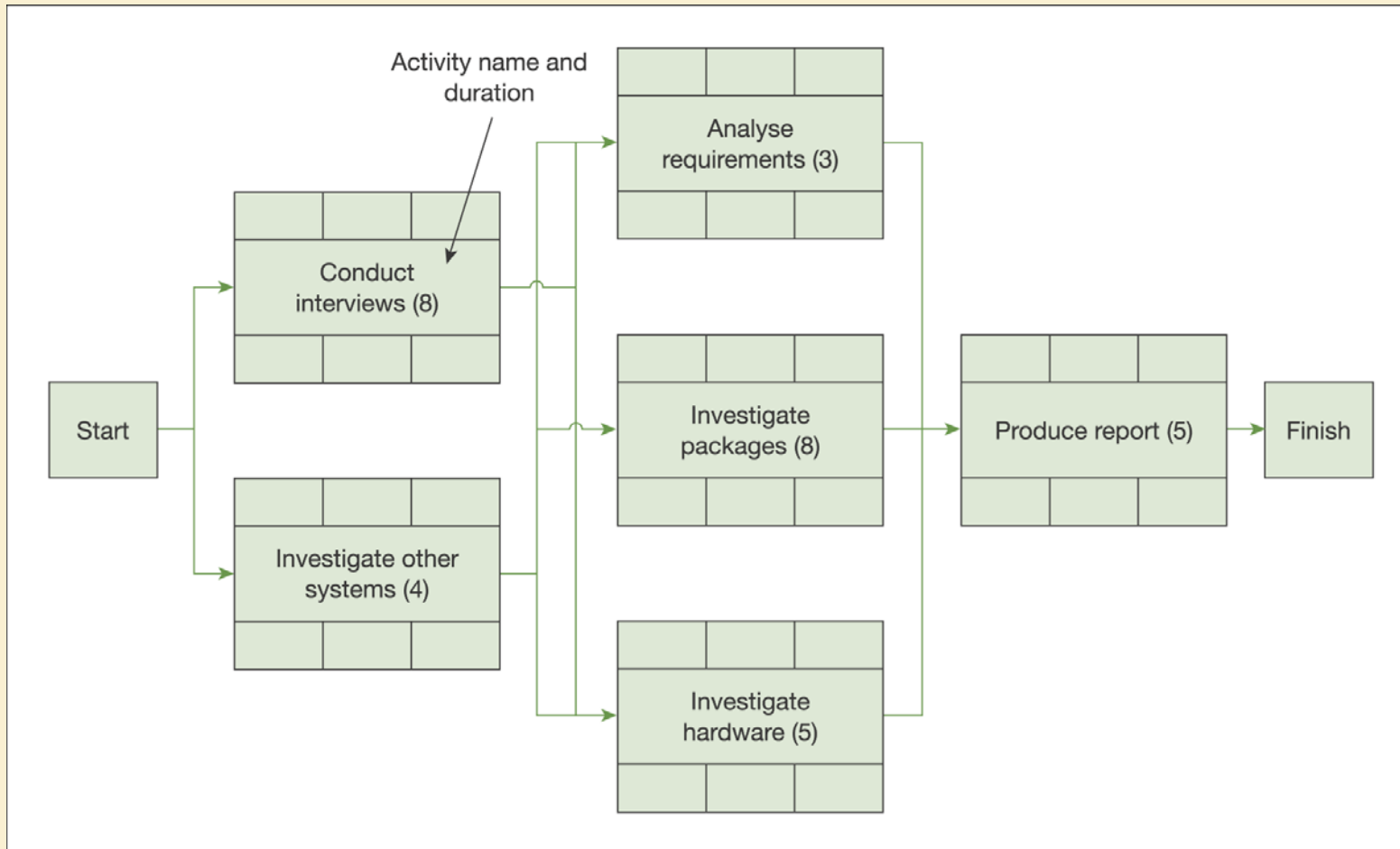# Network diagram (activity-on-node)

Figure 8.15   Network diagram (activity-on-node format)

Effort-monitoring timesheet

Name: DAVE SIMS	Project: PERSONNEL					Week ending: 19 May				
Code		Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	To go
A/01	CODE PROGRAM CV004	6.5	5.0	7.5					19.0	NIL
A/02	TEST PROGRAM CV004				7.5	3.0			10.5	NIL
A/07	CODE PROGRAM EN025					4.0			4.0	15.0
M/03	TEAM MEETING	1.0							1.0	
M/02	COMPLETE TIMESHEET					0.5			0.5	

Figure 11.1 Effort-monitoring spreadsheet

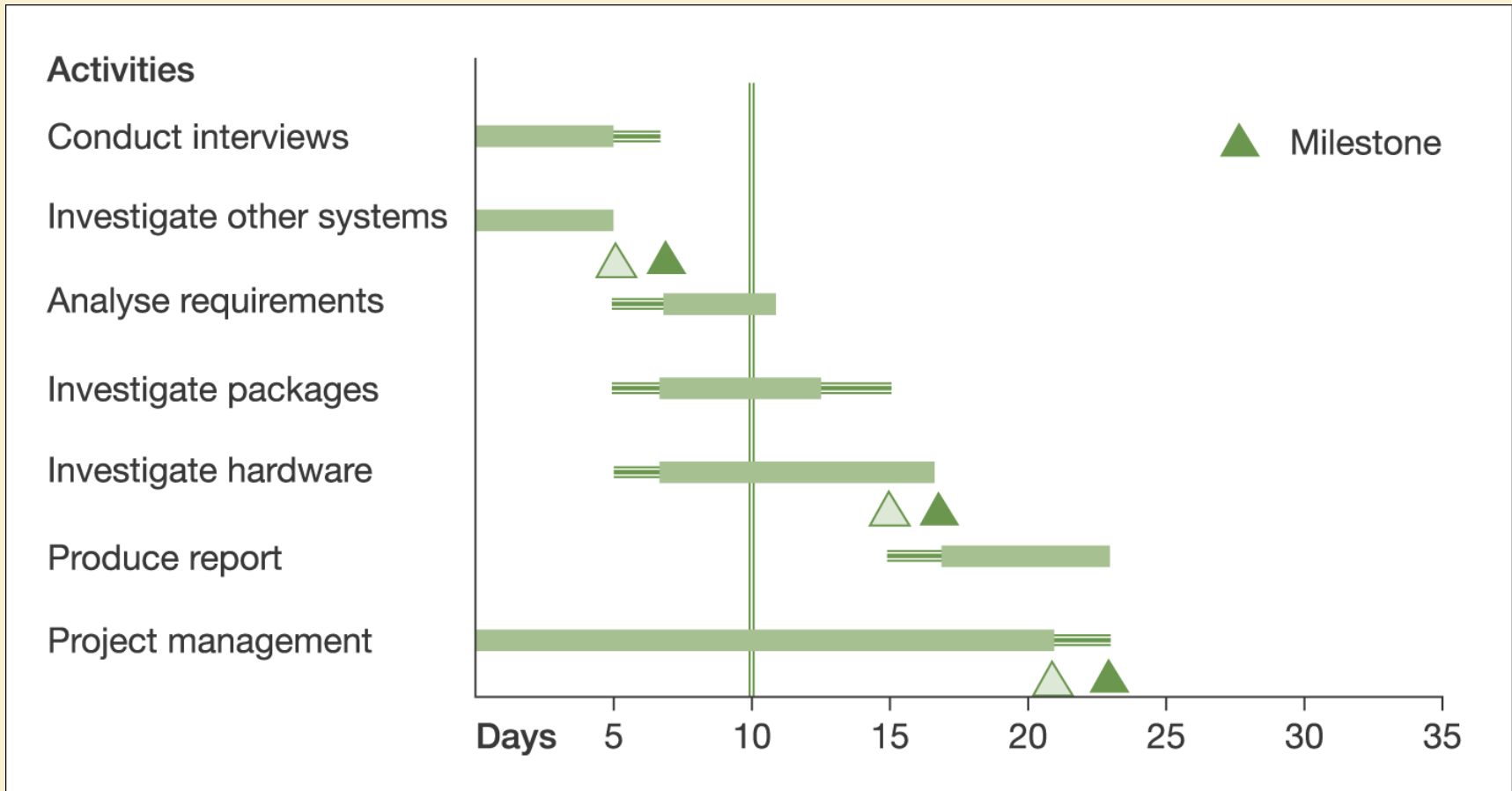# Bar chart illustrating progress

Figure 11.2 Bar chart used to illustrate progress

Possible expenses to consider

- Project-specific training (for example, in the language or environment)
- Specially arranged accommodation
- Lodging and subsistence costs
- Travel
- Consumables
- Insurance

Monitoring quality

- Self-checking by author
- Peer review
- Team leader review
- Walkthrough
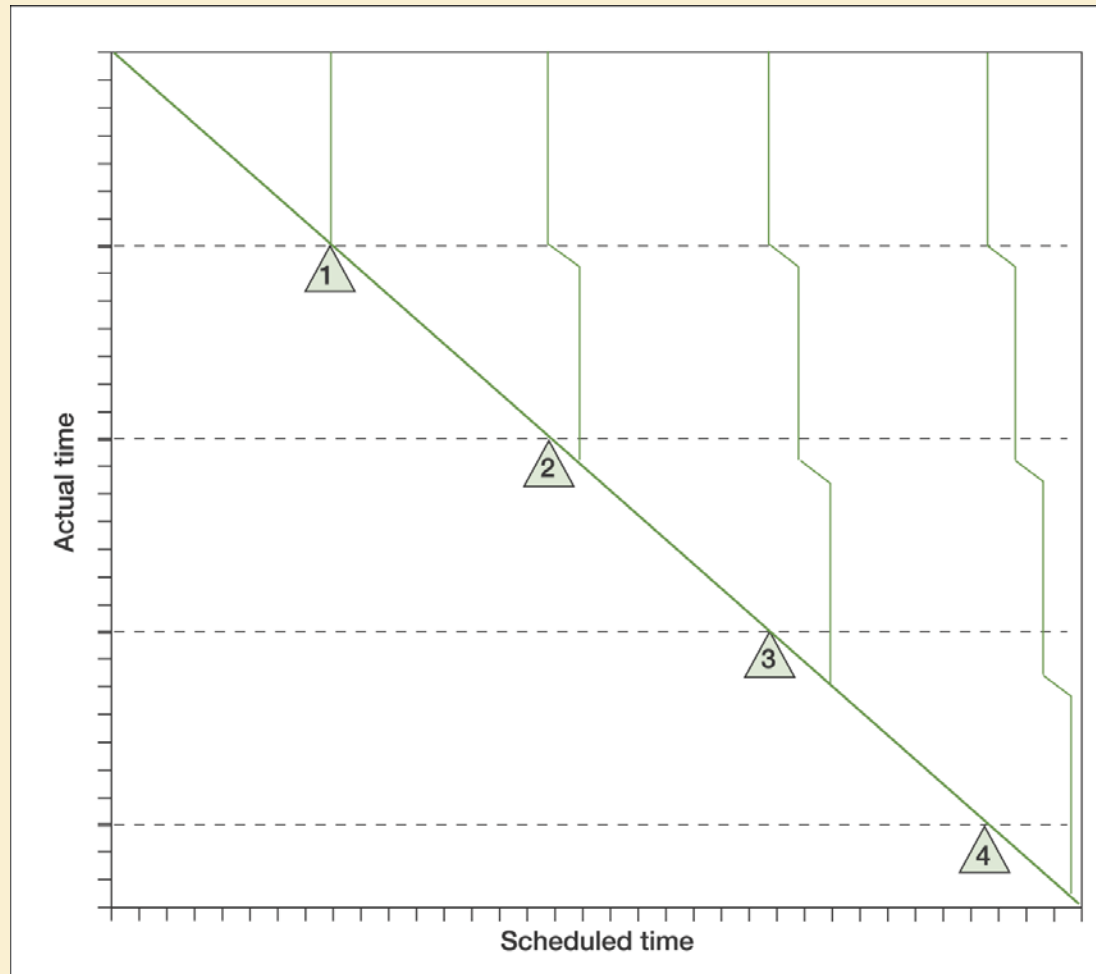- Fagan inspection
- External review

Milestone slip chart

Figure 11.4 Milestone slip chart
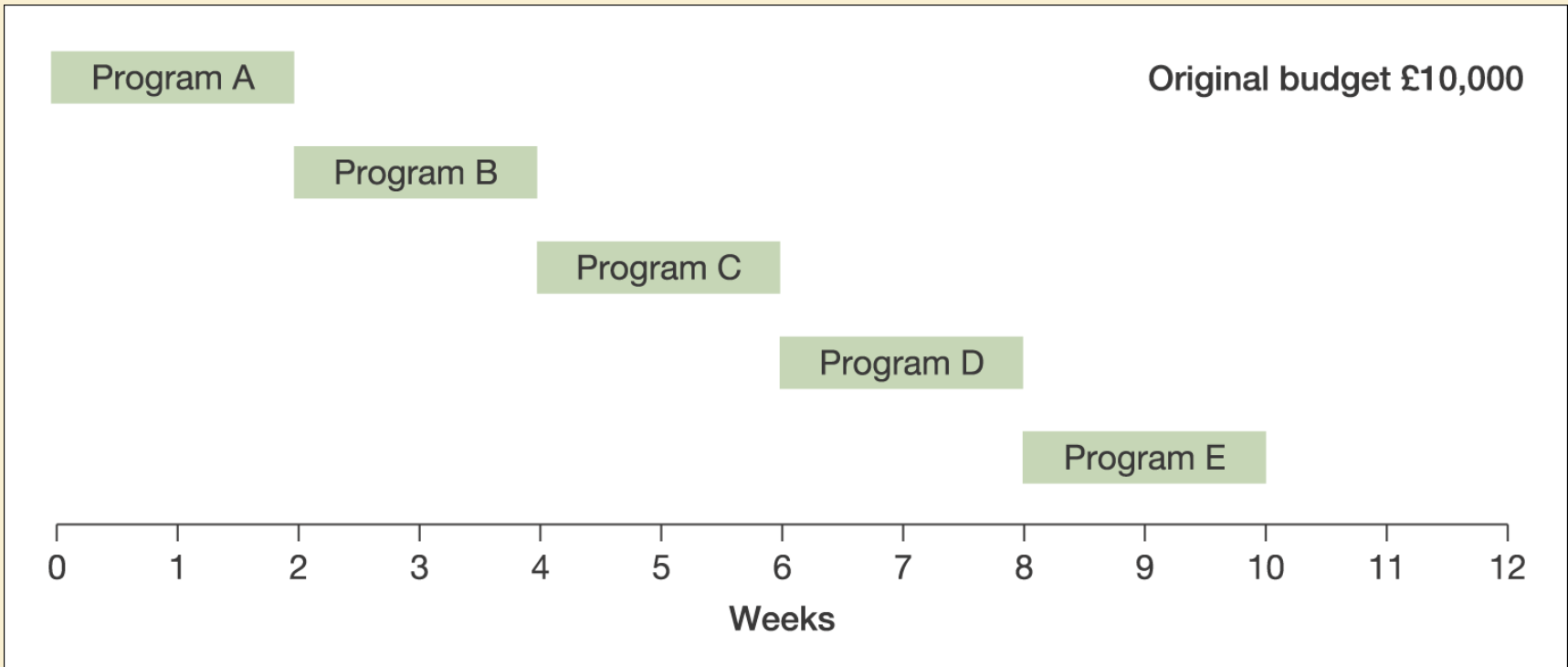
EVA – original plan

Figure 11.5 Earned value analysis – original plan
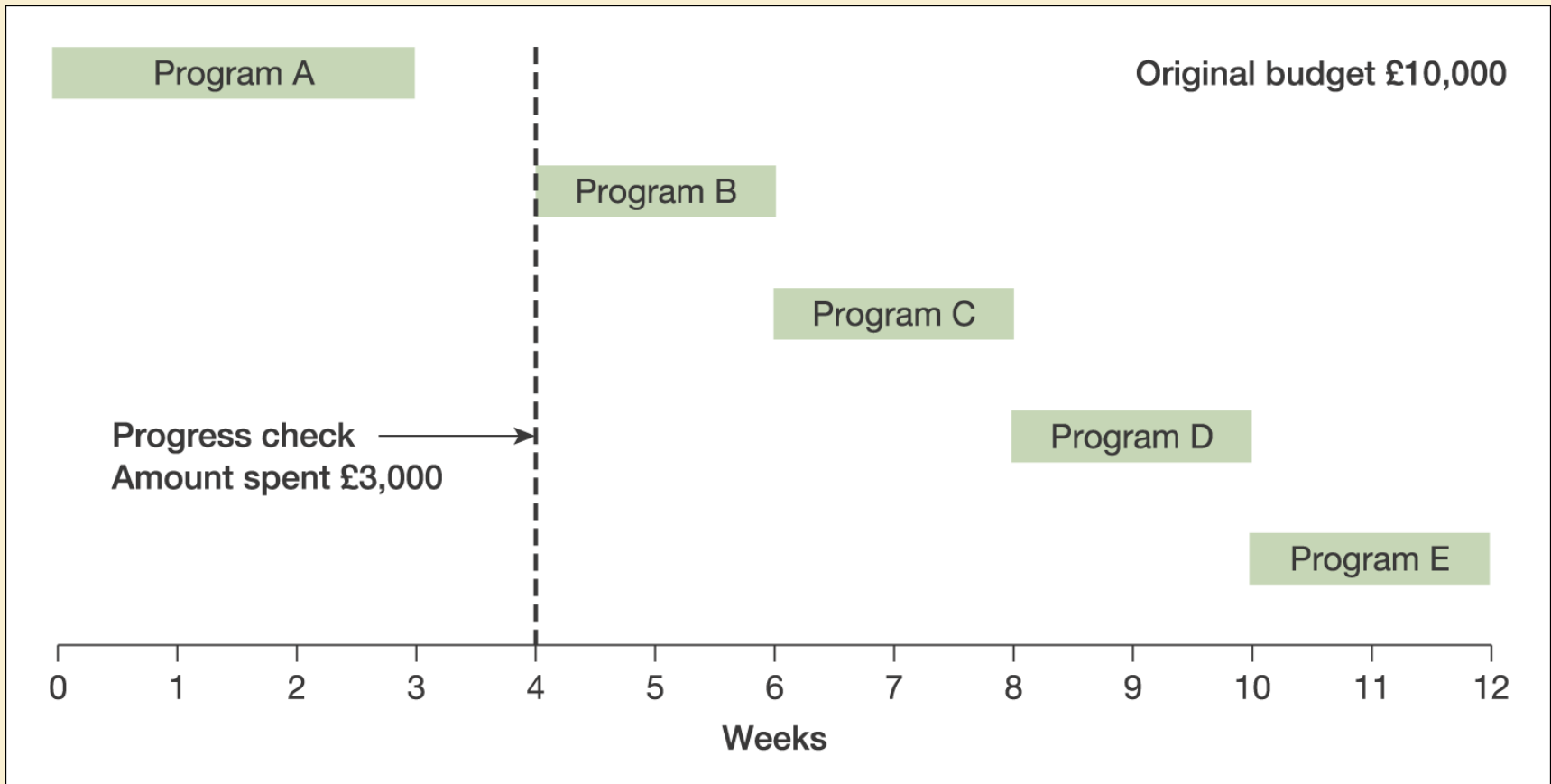
EVA – situation at second progress check

Figure 11.6 Earned value analysis – situation at second progress check

EVA formulae

BCWS - budgeted cost of work scheduled

ACWP - actual cost of work performed

BCWP - budgeted cost of work performed

BCWP−ACWP = <u>Cost variance</u>

BCWP−BCWS = <u>Schedule variance</u>

BCWP/ACWP = <u>Cost performance index</u>

BCWP/BCWS = <u>Schedule performance index</u>

Scheduling effort and elapsed time

- Effort = total volume of work.

- Elapsed time depends on effort and also:

  – How many resources are available.

  – What proportion of their time is available to the project.

  – Delays outside the team's control (eg lead times for hardware).

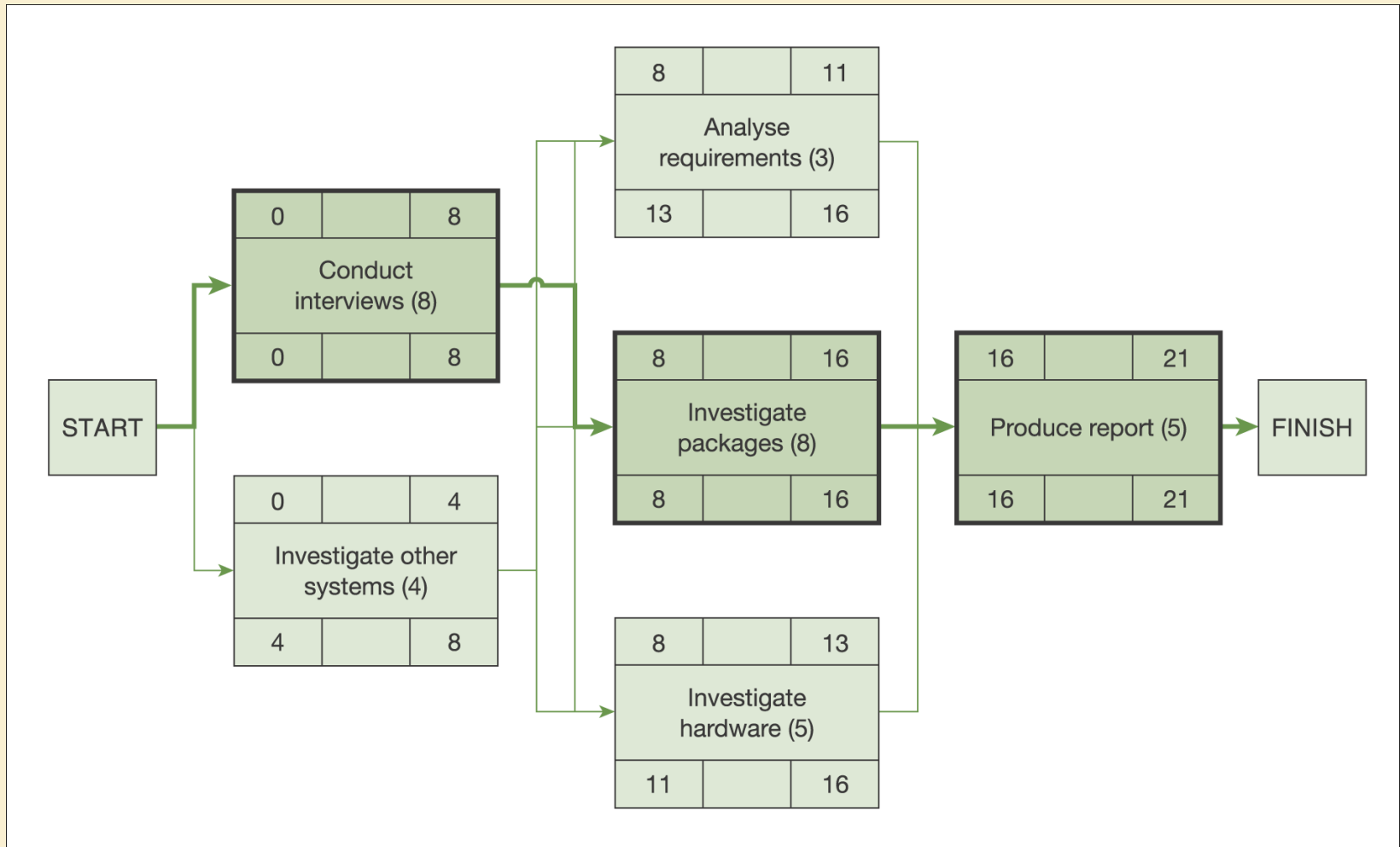 – Dependencies on others.

Network diagram

Figure 10.1 Dependency network with activity durations
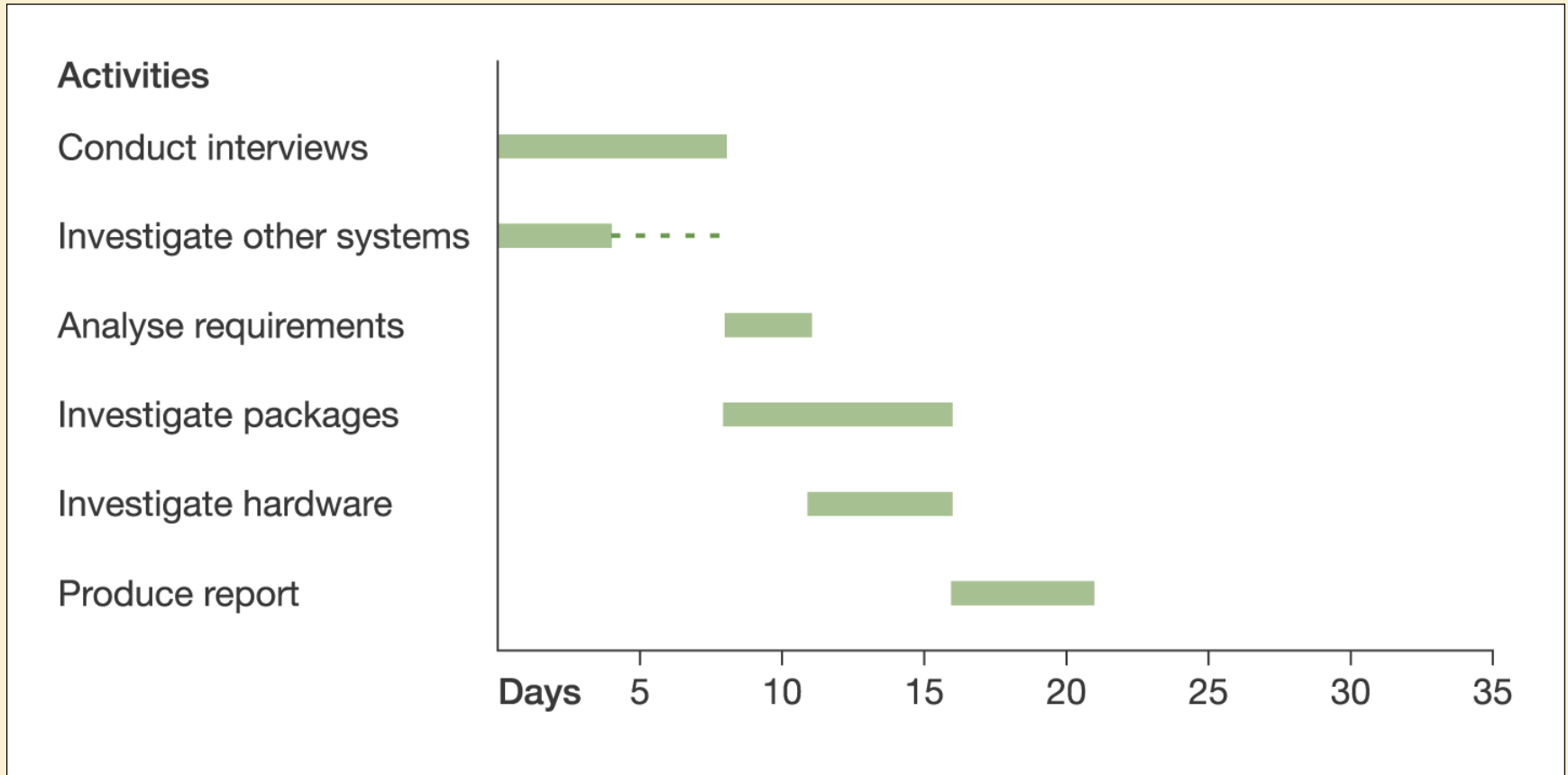
Bar chart

Figure 10.3 Schedule for two-person team showing parallel activities
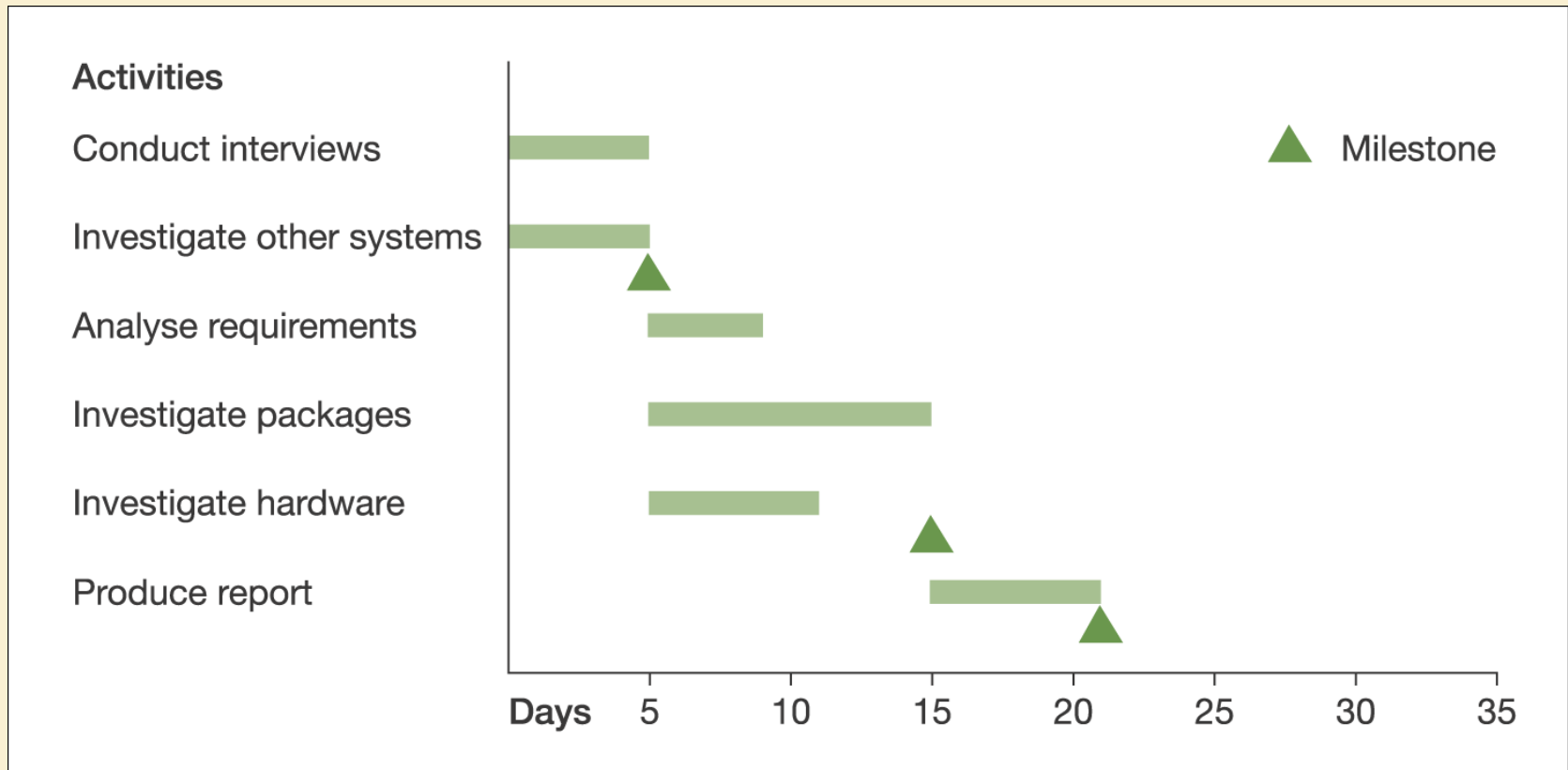
Bar chart with milestones added

Figure 10.6 Bar chart showing project milestones
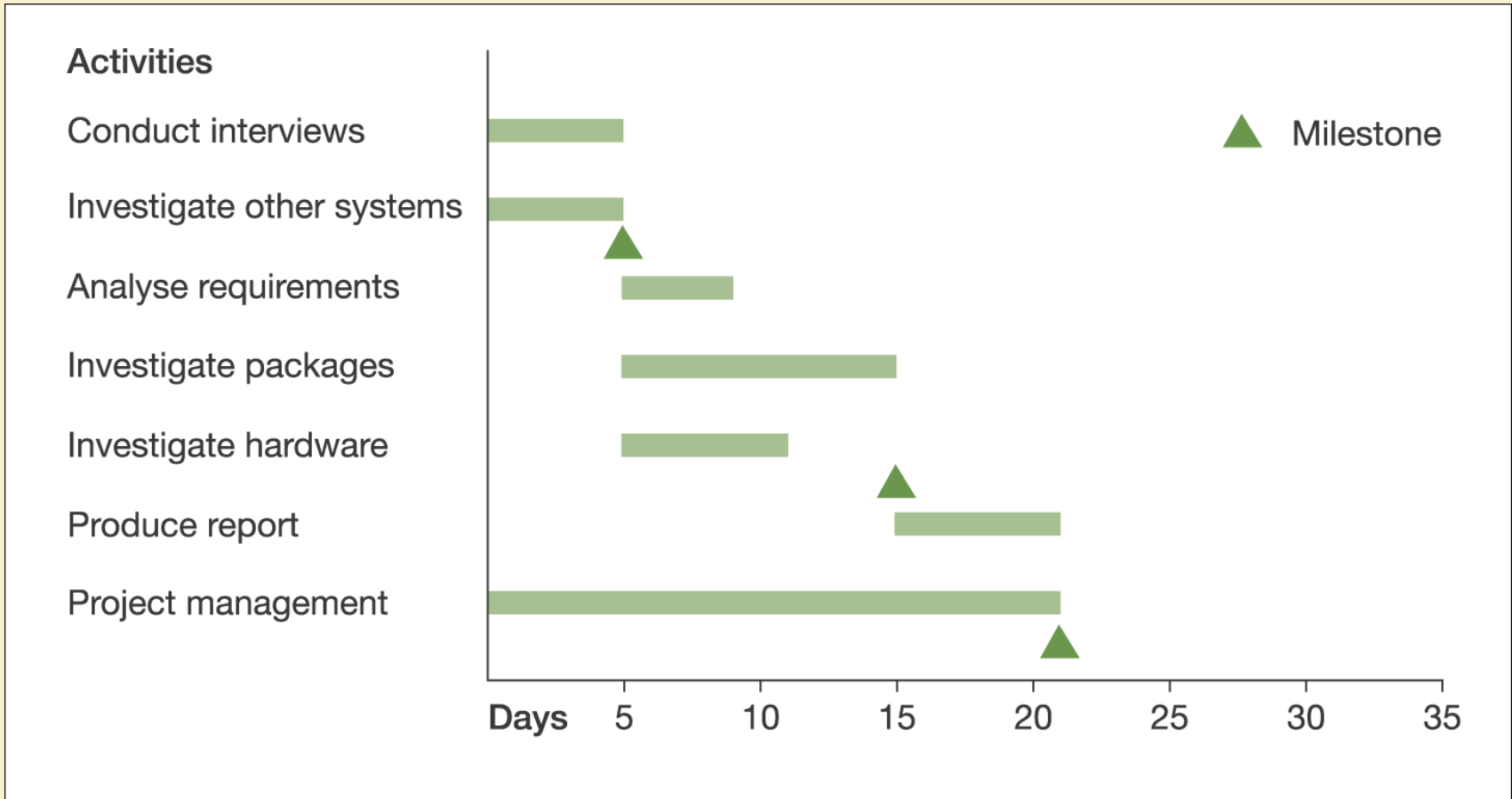
Bar chart with 'overhead' task added

Bar chart and resource histogram
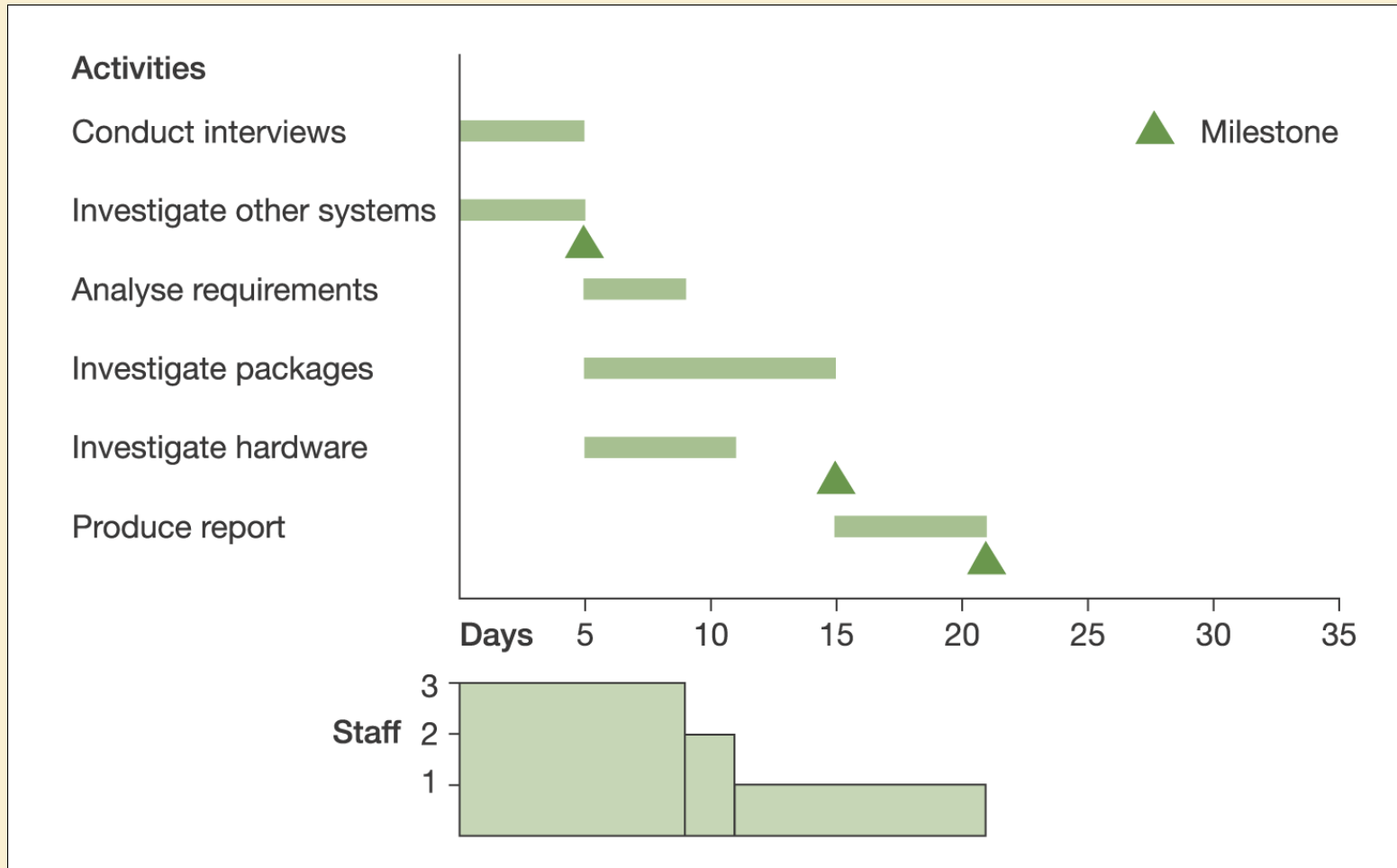
Figure 10.8 Bar chart with resource histogram

The project and other plans

PROJECT PLAN **Why? What? When? Where? Who?**	**QUALITY PLAN** **How?**	**RISK MANAGEMENT PLAN** **Why not?**

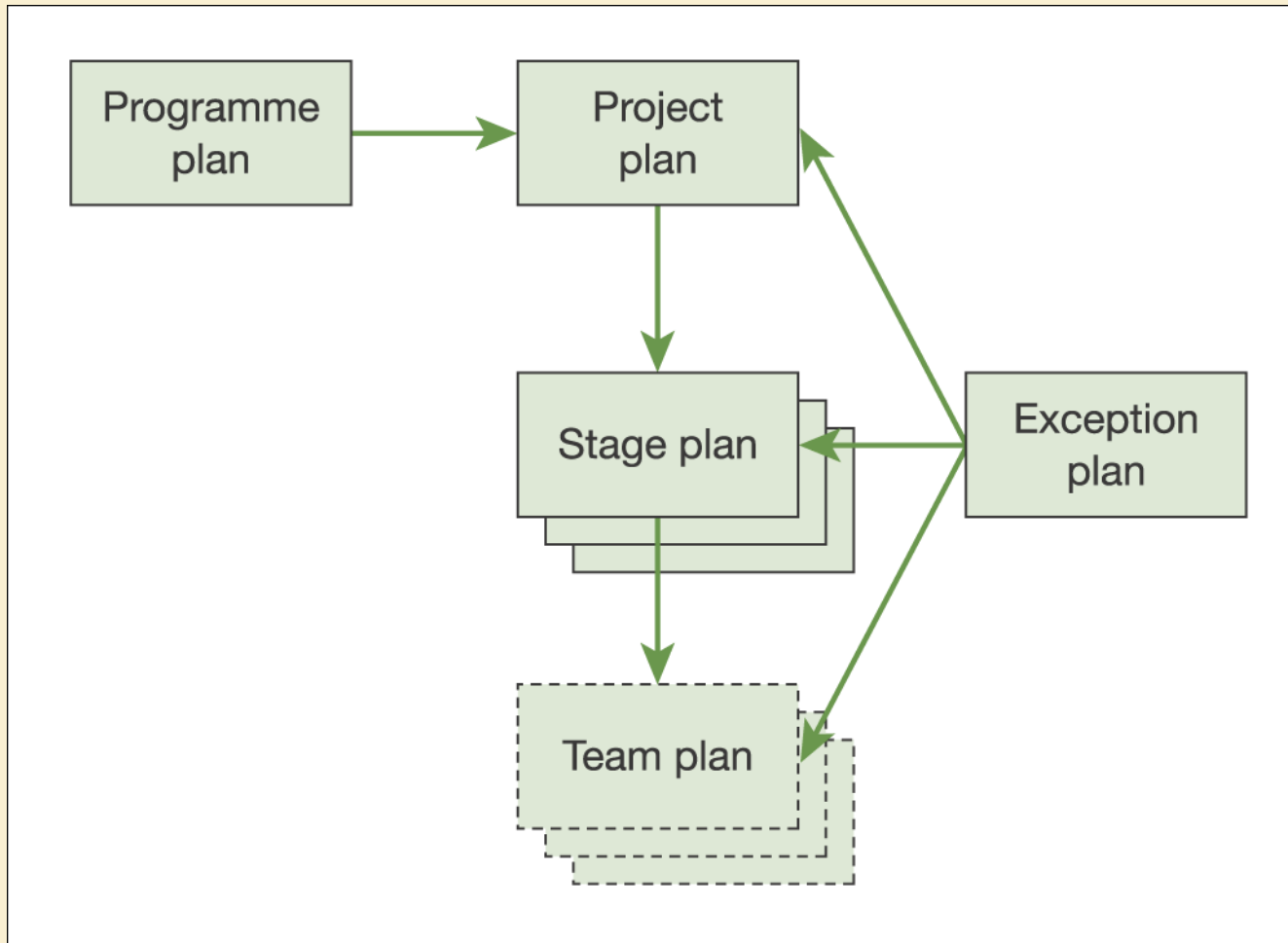**One plan or three?**

PRINCE2® plans

Figure 10.10 PRINCE2® plans

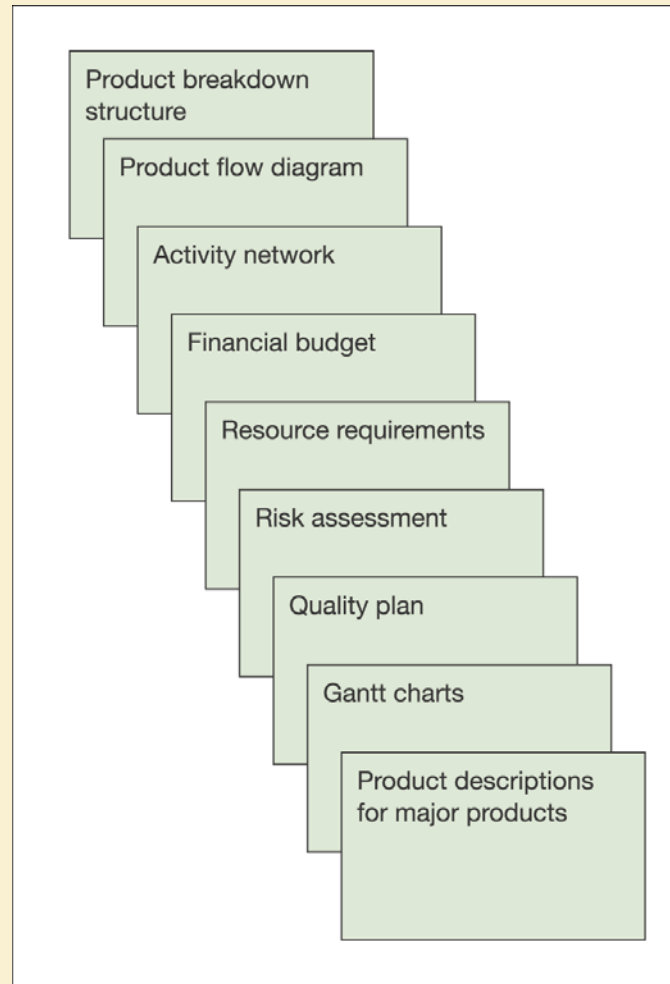# Contents of PRINCE2® project/stage plan

Figure 10.11 Contents of PRINCE2® project and stage plans

Project budget

BUDGET FOR: NEW CUSTOMER CONTACT SYSTEM									
Expenditure code and heading		Monthly figures							Totals
		Mar	Apr	May	Jun	Jul	Aug	Sep	
A	Direct labour	50	50	70	90	120	70	30	480
B	Subcontract work		30	30	60	60	30		210
C	Hardware	100				200			300
D	Software	30				60			90
E	Telecommunications	10				60			70
F	Travel	3	3	1	1	3	2	1	14
G	Accommodation and subsistence	2	2	1	1	2	2	1	11
H	Project-specific training	10							10
I	Support services					2	6	5	13
J	Consultancy support	2	2	2	2	6	2	1	17
Contingency (10%) – items B–J only		16	4	3	6	39	4	1	74
Monthly totals:		207	87	104	154	513	112	38	1289

Figure 10.13 Example budget for an IT project

Value engineering and value management

Value engineering

- Agreed objectives
- Aim: to achieve these at minimum cost

Value management

- No agreed objectives – at first
- Agrees objectives
- And means of attaining them

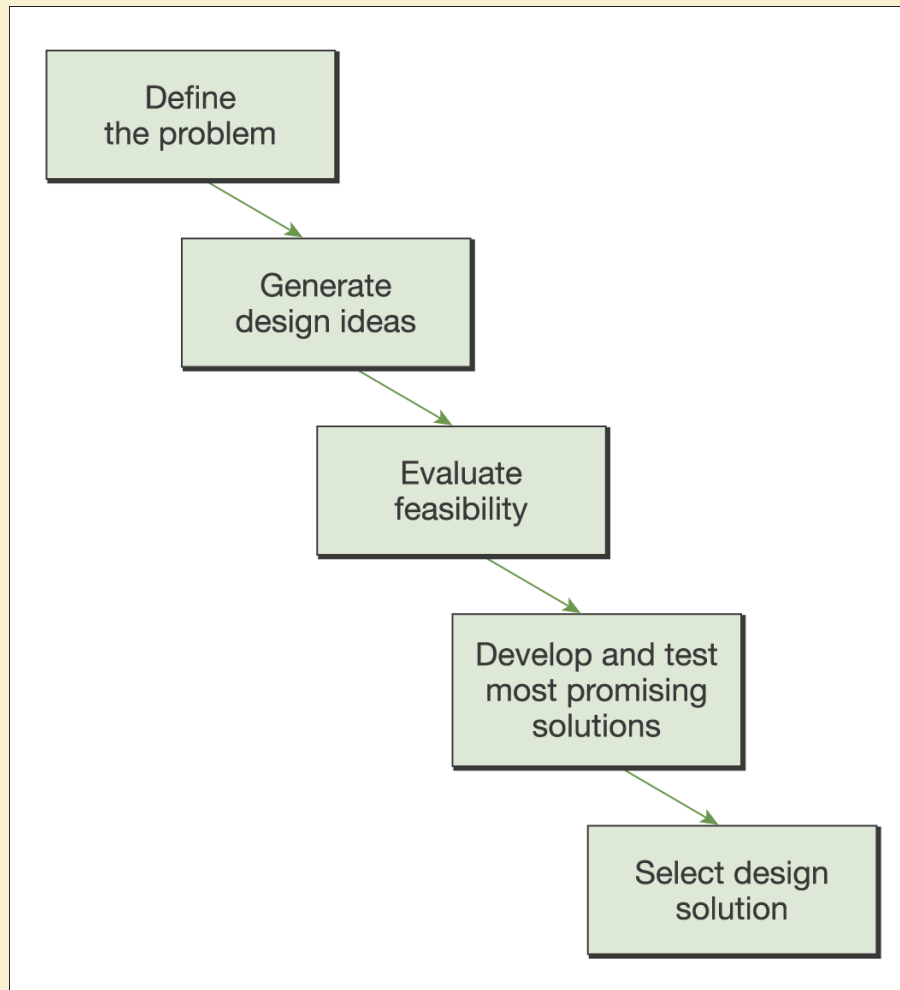# The value engineering approach

Figure 16.1   The value engineering approach

The value management approach

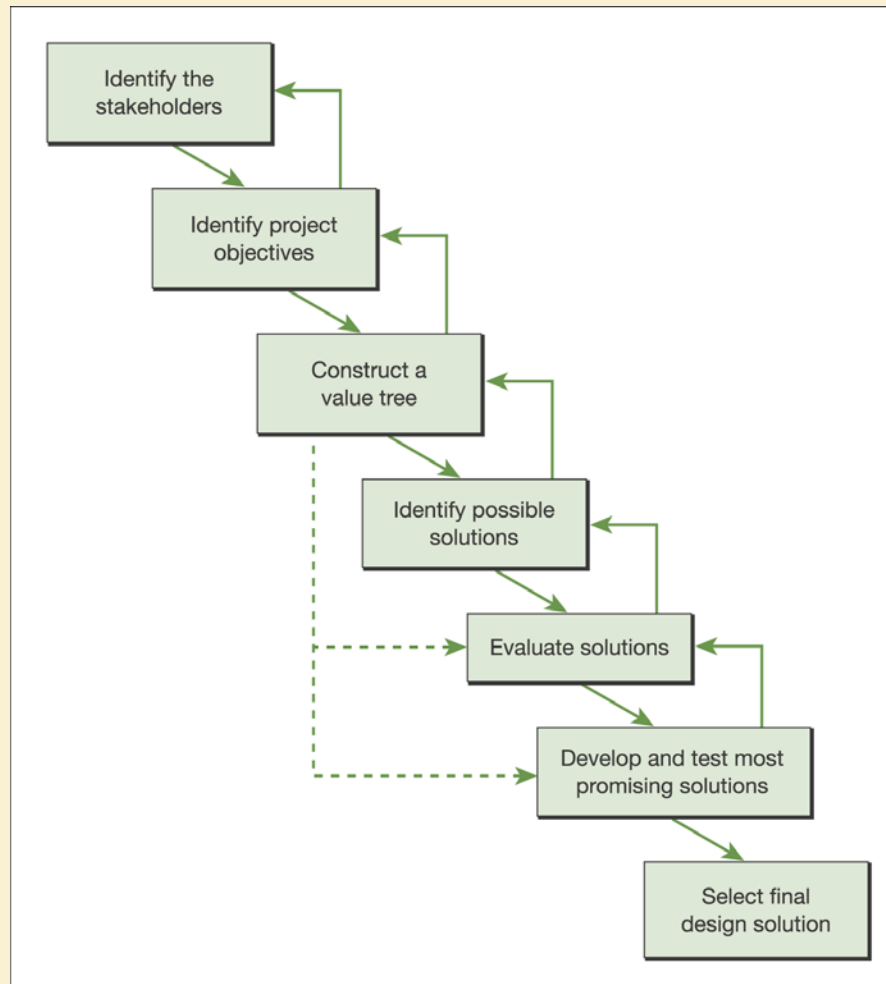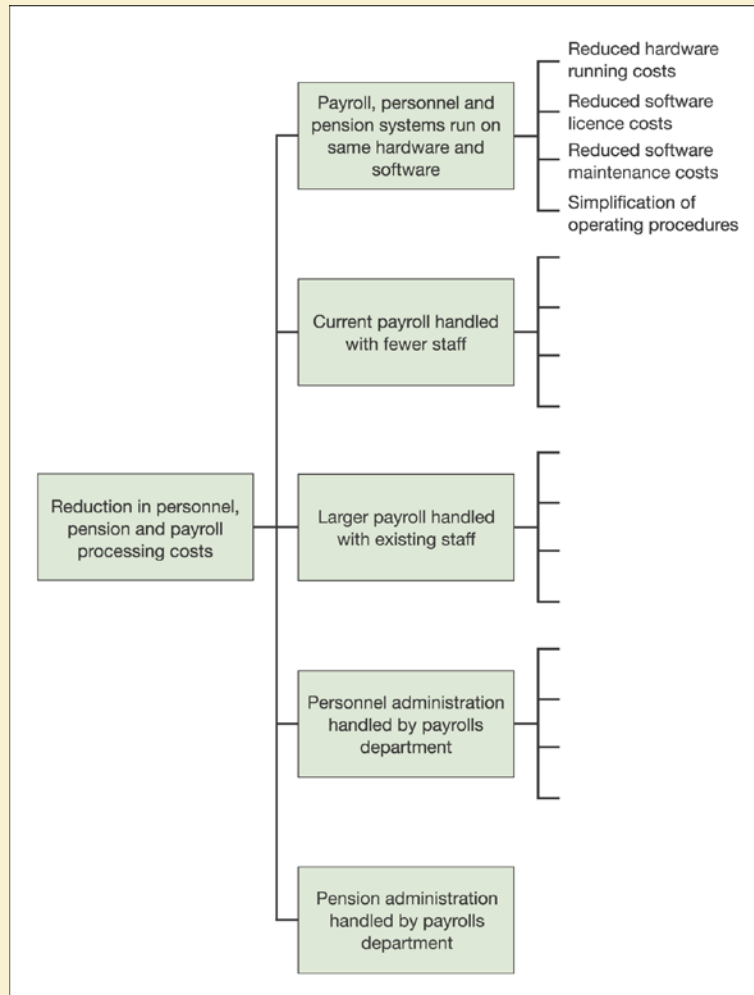Figure 16.2 The value management approach

Value tree

Figure 16.3 Value tree