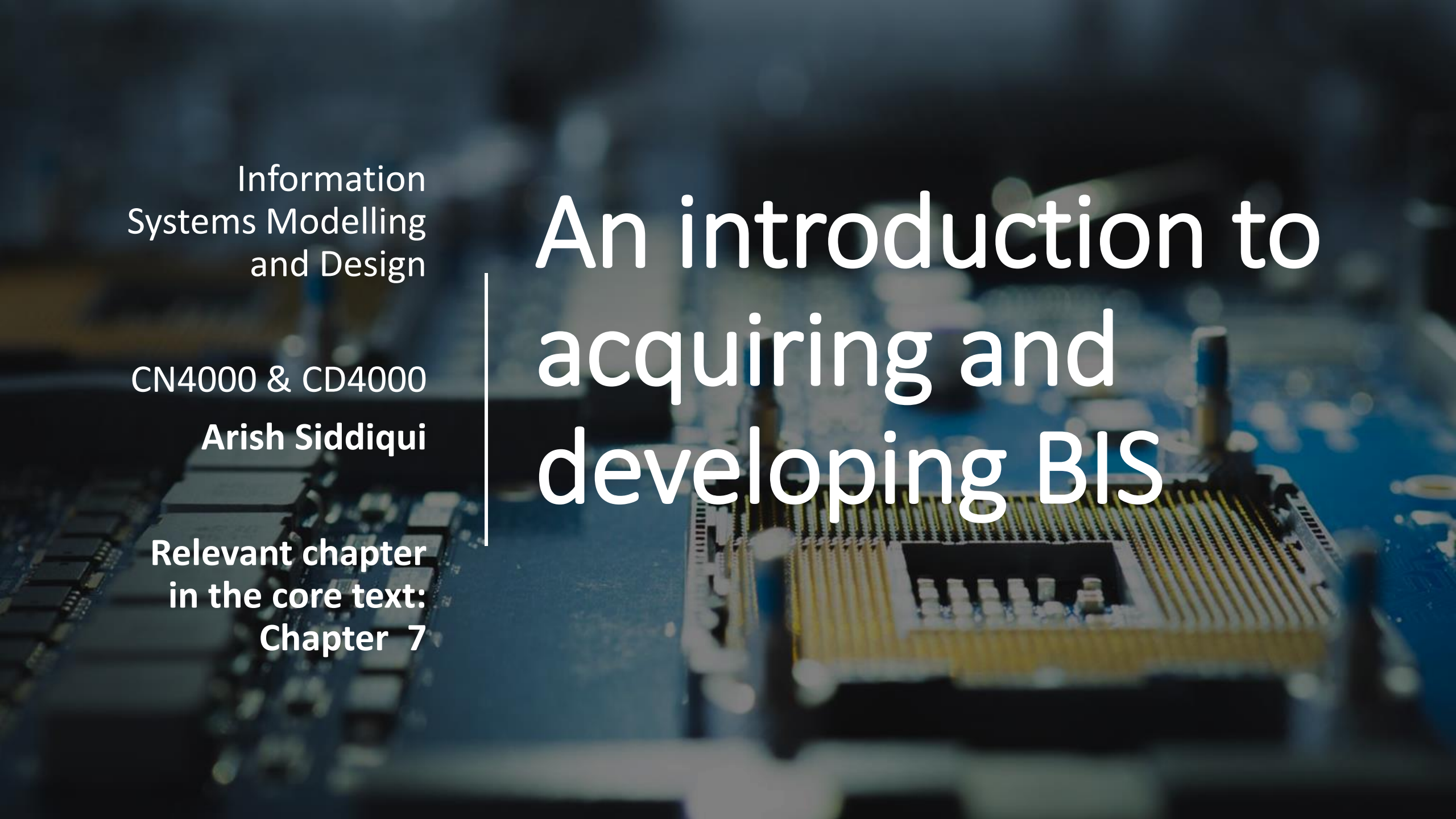


Information Systems Modelling and Design

CN4000 & CD4000

Arish Siddiqui

Relevant chapter in the core text: Chapter 7

An introduction to acquiring and developing BIS

Learning Outcomes

- **After this lecture, you will be able to:**
  - What is BIS ?
  - evaluate the different alternatives for acquiring BIS;
  - distinguish between the typical stages involved in building BIS;
  - explain the purpose of each stage in building a system;
  - select the best alternative type of approach or methodology for building a BIS.

What is a BIS?

'A business information system is a group of interrelated components that work collectively to carry out:

- *input, processing, output, storage and control actions which converts data into information products.*

These information products can be used to support

forecasting, planning, control, coordination, decision making and operational activities in an organisation.'

Systems theory

Systems theory: provides a powerful means of analysing and improving business processes.

A **system:** a collection of interrelated components that work together towards a collective goal.

- The function of a system is to receive inputs and transform these into outputs.

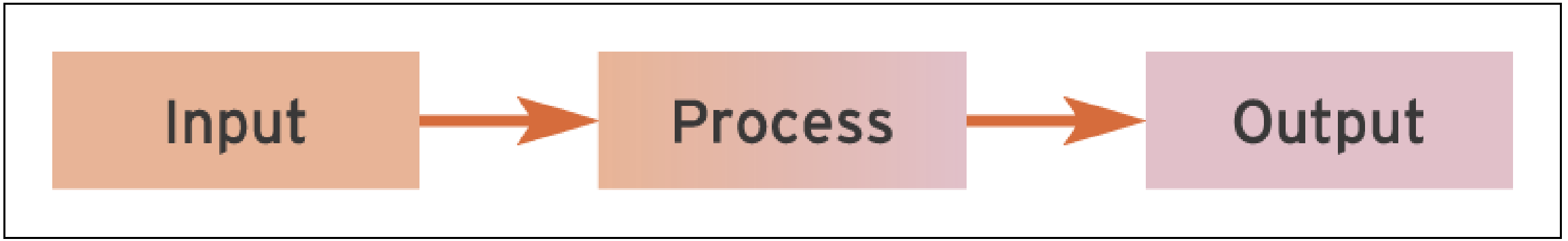
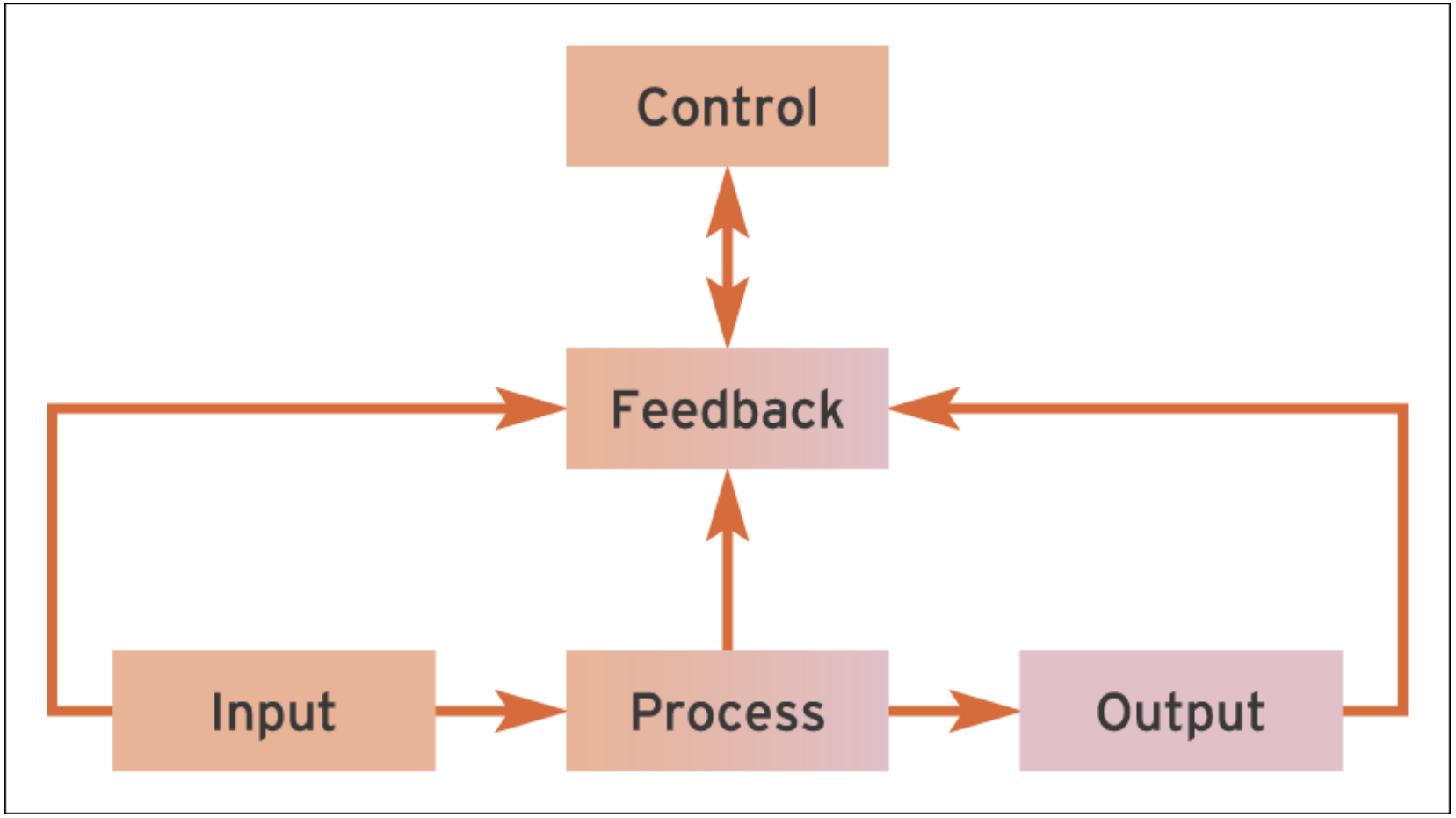


Figure 2.1 A basic model of a transformation process

Figure 2.2 A generic model of a system



System Characteristics

Objective – all components of a system should be related to one another by common objective

Environment– the surroundings of the systems e.g. for organisation: customers, sales channels/distributors, suppliers, partners, government and legislation, the economy

Boundary – the scope of the system is defined by the boundary**;** it marks the interface between a system and its environment

System Characteristics cont…

Subsystems exchange information through interfaces

The linkage between subsystems – **coupling –** how closely linked different subsystems are.

Interdependence – a change of one part of the systems leads to or result from changes to one or more other parts

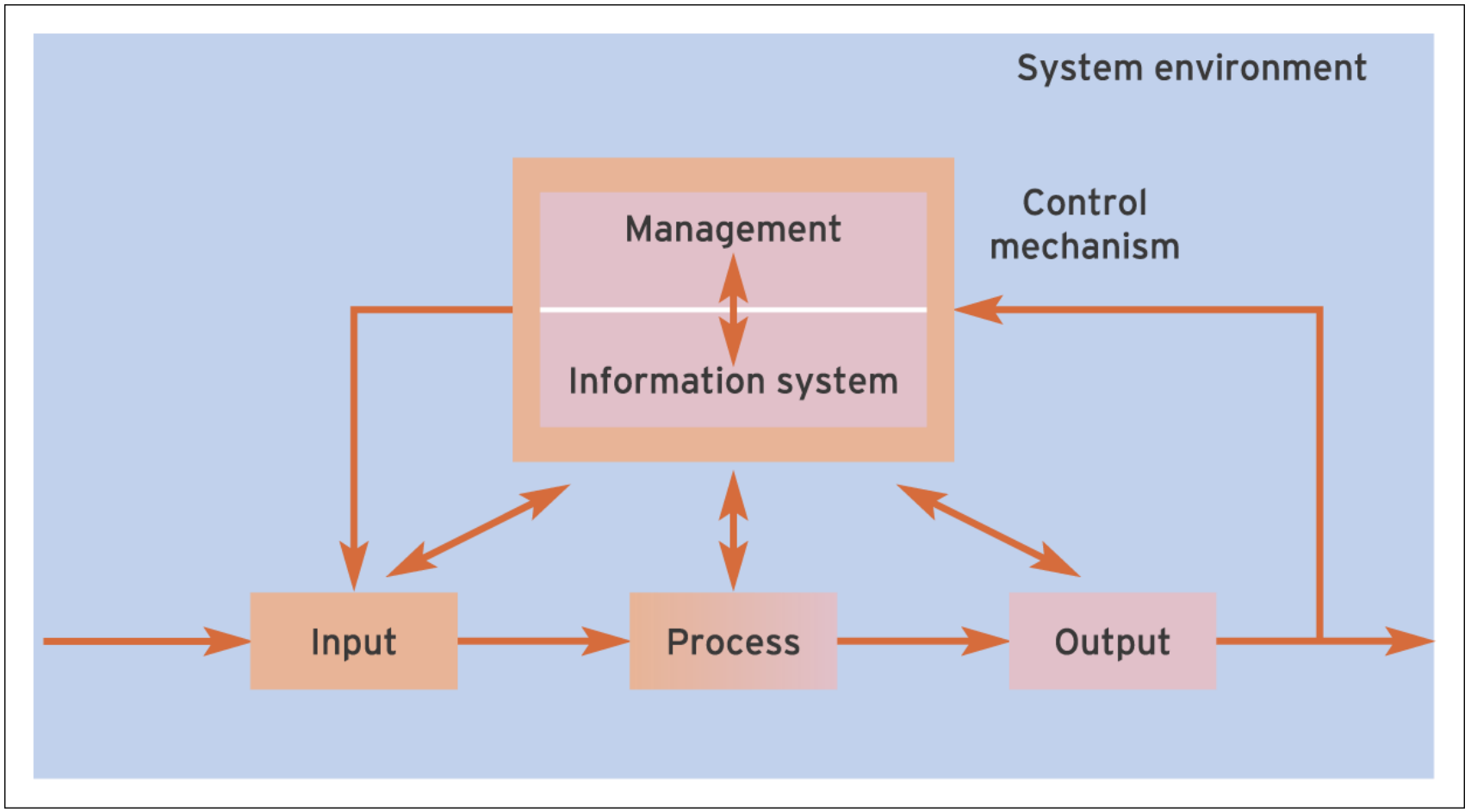


Figure 2.3 Business information systems as an organisational control mechanism

Resources that support BIS

1. **People resources**: People resources include the users of an information system and those who develop, maintain and operate the system.

2. **Hardware resources**: The term hardware resources refers to all types of machines, not just computer hardware.

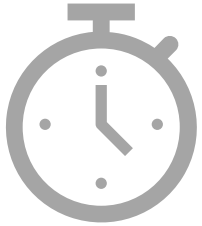
3. **Software resources**: In the same way, the term software resources does not only refer to computer programs and the media on which they are stored, but the term can also be used to describe the procedures used by people.

Resources that support BIS

4. Communications resources: Resources are also required to enable different systems to transfer data.

5. Data resources: Data resources describe all of the data that an organisation has access to, regardless of its form.

Advantages of computer processing



Speed: Computers can process millions of instructions each second, allowing them to complete a given task in a very short time.

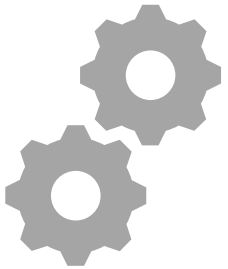
Accuracy: The result of a calculation carried out by a computer is likely to be completely accurate.

Reliability: computer-based information systems operate for twenty-four hours a day and are only ever halted for repairs or routine maintenance.

Advantages of computer processing

Programmability: the ability to modify the software that controls them provides a high degree of flexibility.

Even the simplest personal computer, for example, can be used to create letters, produce cash flow forecasts or manipulate databases.

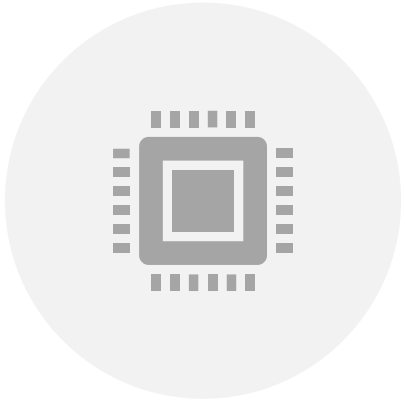


Repetitive tasks: Computer-based information systems are suited to highly repetitive tasks that might result in boredom or fatigue in people.

The use of technology can help to reduce errors and free employees to carry out other tasks.

Limitations of computer-based processing

JUDGEMENT/EXPERIENCE: DESPITE ADVANCES IN ARTIFICIAL INTELLIGENCE TECHNIQUES AND EXPERT SYSTEMS, COMPUTER-BASED INFORMATION SYSTEMS ARE CONSIDERED INCAPABLE OF SOLVING PROBLEMS USING THEIR OWN JUDGEMENT AND EXPERIENCE.

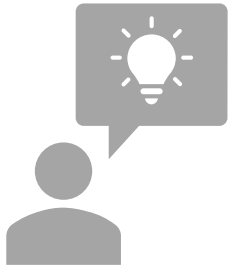


FLEXIBILITY: IN GENERAL, COMPUTER-BASED INFORMATION SYSTEMS ARE UNABLE TO REACT TO UNEXPECTED SITUATIONS AND EVENTS.

INNOVATION: COMPUTERS LACK THE CREATIVITY OF A HUMAN BEING.

Limitations of computer-based processing cont..

Intuition: Human intuition can play an important part in certain social situations.



Qualitative information: Managers often make unstructured decisions based on the recommendations of others.

Their confidence in the person they are dealing with often has a major influence on the decision itself.

Once again, BIS cannot act upon qualitative information of this kind.

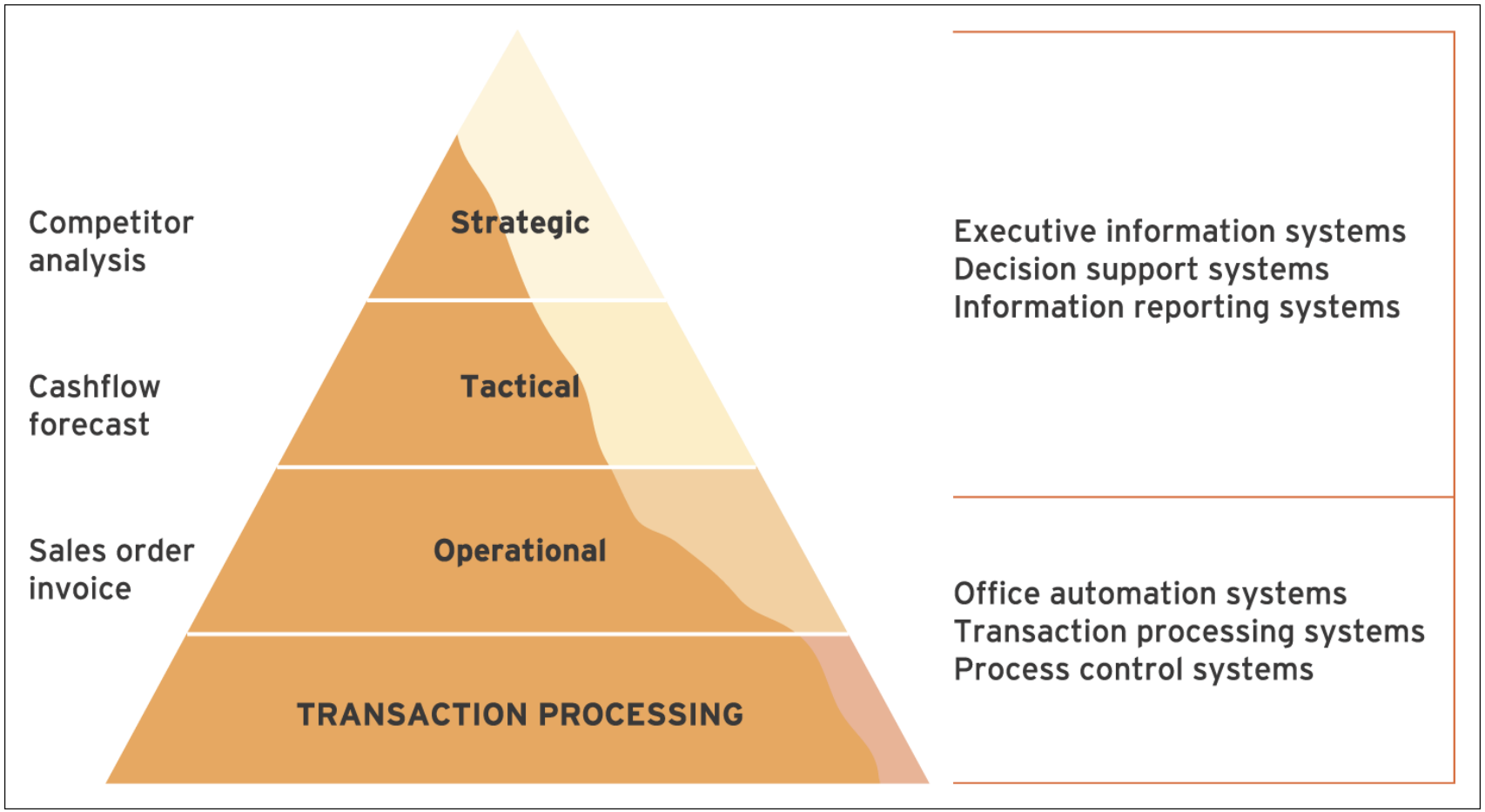
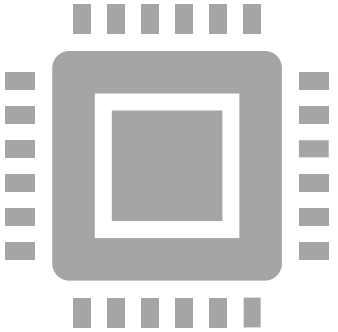


Figure 2.7 Usage and applications of computer-based information systems by organisational level (shading denotes usage of BIS)

Activity 2.1 – Example of information systems

What information systems might be found in your newsagent or corner shop?



For each system identified, list the people, hardware, communications, software and data resources involved.

E-business and e-commerce

ELECTRONIC BUSINESS (E-BUSINESS):

ALL ELECTRONICALLY MEDIATED INFORMATION EXCHANGES, BOTH WITHIN AN ORGANISATION AND WITH EXTERNAL STAKEHOLDERS SUPPORTING THE RANGE OF BUSINESS PROCESSES.

E-business and e-commerce

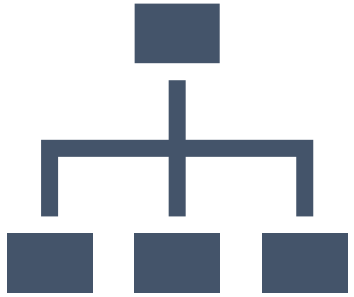
ELECTRONIC COMMERCE (E-COMMERCE):

ALL ELECTRONICALLY MEDIATED INFORMATION EXCHANGES BETWEEN AN ORGANISATION AND ITS EXTERNAL STAKEHOLDERS.

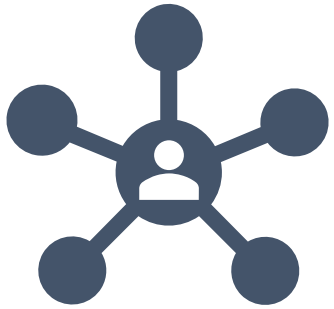
e-commerce

- **Buy-side e-commerce**: E-commerce transactions between a purchasing organisation and its suppliers.
- **Sell-side e-commerce**: E-commerce transactions between a supplier organisation and its customers.

Enterprise Systems



Enterprise systems aim to support the business processes of an organisation across any functional boundaries that exist within that organisation.



They use internet technology to integrate information within the business and with external stakeholders such as customers, suppliers and partners.

Enterprise Systems

- Four main elements of an enterprise system are the following:
  - enterprise resource planning (ERP) which is concerned with internal production, distribution and financial processes;
  - customer relationship management (CRM) which is concerned with marketing and sales processes;
  - supply chain management (SCM) which is concerned with the flow of materials, information and customers through the supply chain and;
  - supplier relationship management (SRM) which is concerned with sourcing, purchasing and the warehousing of goods and services.

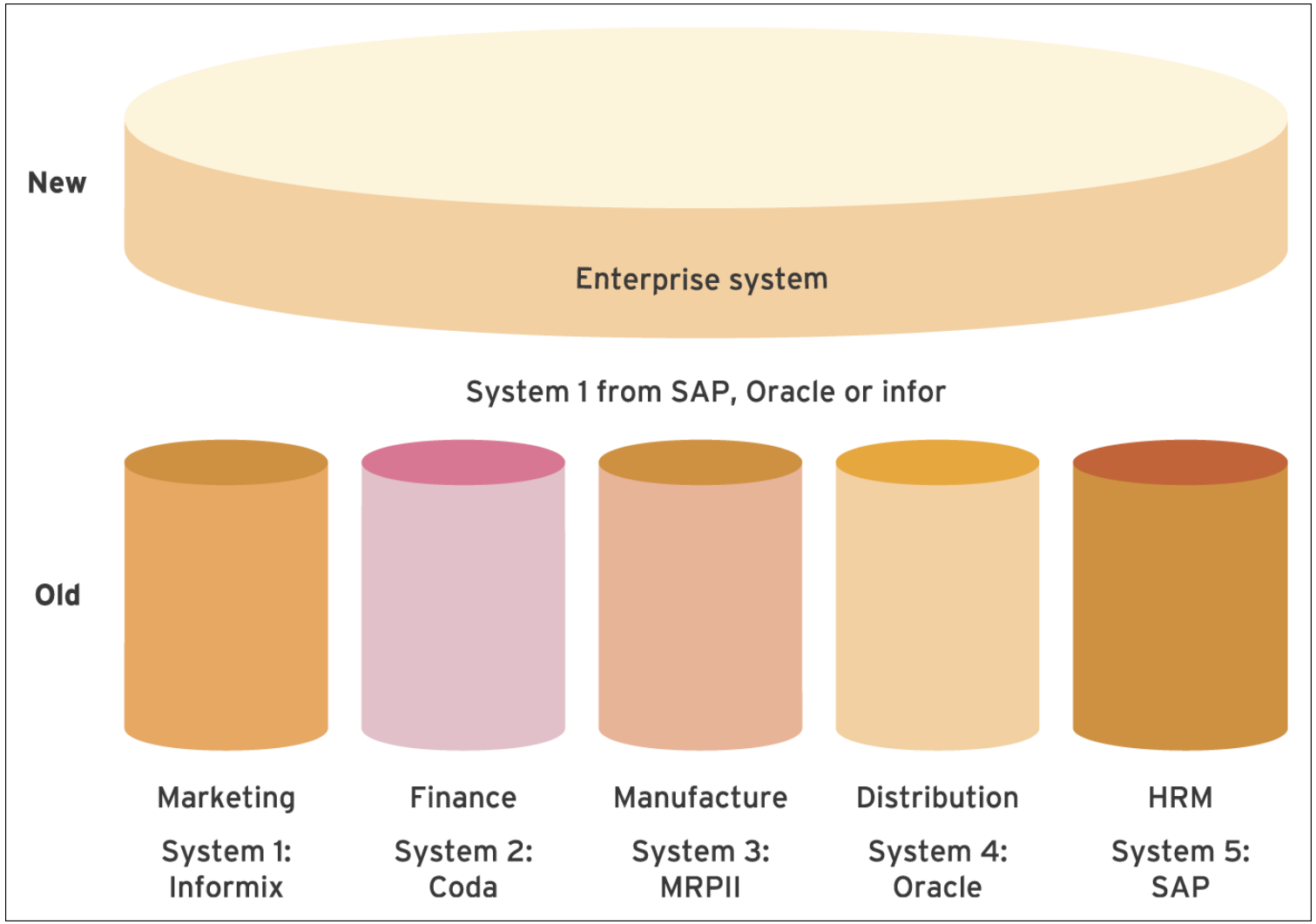


Figure 2.8 Enterprise system in comparison to separate functional applications

Introducing BIS acquisition

- **BIS acquisition**: The process of evaluating and implementation for a BIS.
- **Systems development lifecycle (SDLC)**: Any information systems project follows a logical series of development phases. These are known as the systems development lifecycle.
- **SDLC stages**: Initiation, feasibility study, analysis of business requirements, systems design, system build and implementation and, finally, review and maintenance.

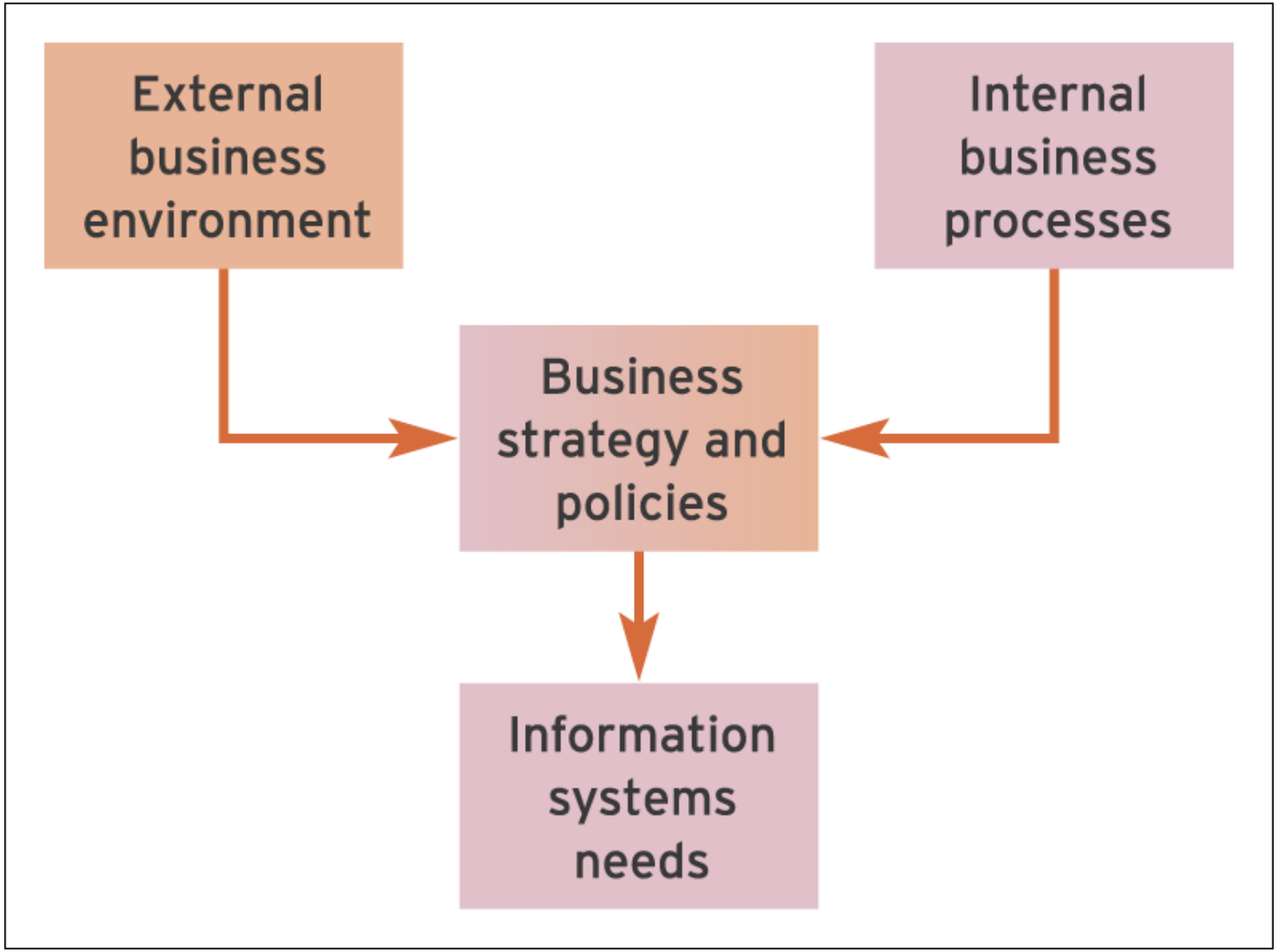


Figure 7.1 Drivers for information systems aquisition

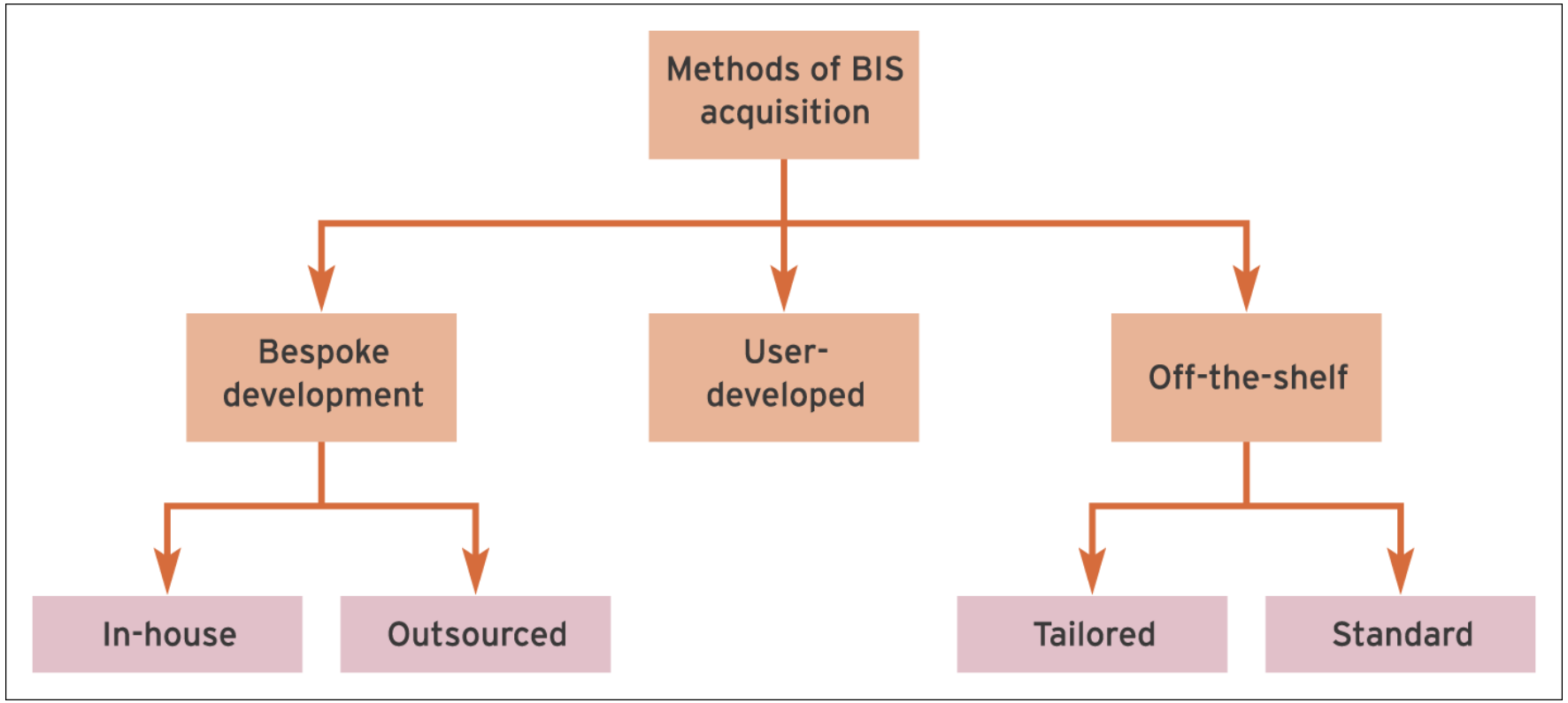


Figure 7.2 An example of a typical evaluation of alternatives for BIS acquisition

Bespoke development

Bespoke development: An IS is developed ‘from scratch’ by an IS professional to suit the business requirements of the application.

Benefits:

- Tailored to requirements of business
- May confer specific competitive advantage.

Problems:

- Expense – Most expensive way of developing a new information system
- Time – Development is often delayed
- Quality – Software code may contains bugs.

Off-the-shelf purchase

Off-the-shelf purchase: An acquisition method that involves direct purchase of a pre-written application used by more than one company.

Benefits:

Time – Quick purchase	Cost – Low cost due to economies of scale	Quality – Should offer stability and be feature-rich.

Drawbacks:

May omit some features specifically required by individual customer	Requires changes to process to meet needs of software.

Off-the-shelf purchase

A *tailored off-the-shelf* purchase is an off-the-shelf purchase that has specific programming development or extensive configuration tailored to the needs of the customer.

A *component off-the-shelf* purchase is an off-the-shelf purchase that can be configured using pre-written modules.

End-user-developed software

End-user-developed software: Software written by non-IS professionals, i.e. the business users.

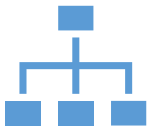
Benefits:

- Tailored to the needs of end-users
- Often relatively fast.

Drawbacks:

- May not achieve wider business objectives
- Quality may be a problem when written by non-IS professional. Maintenance may be difficult.

Other factors affecting selection



Size of the organisation

Size of in-house IT capability

Complexity of information system (are there special issues for the market the company operates in)

End-user experiences

Linkages to other applications/data sources

Summary – acquisition alternatives

Acquisition option	Delivery time	Cost	Quality: bugs	Quality: fits business needs
Bespoke in-house	Poor	Poor	Poor	Good
Bespoke software house	Good	Very poor	Medium	Medium
End-user development	Poor	Medium	Poor	Good
Tailored – off-the-shelf	Good	Good	Good	Medium
Standard – off-the-shelf	Very good	Very good	Very good	Poor

Table 7.1 An evaluation of alternatives for BIS acquisition

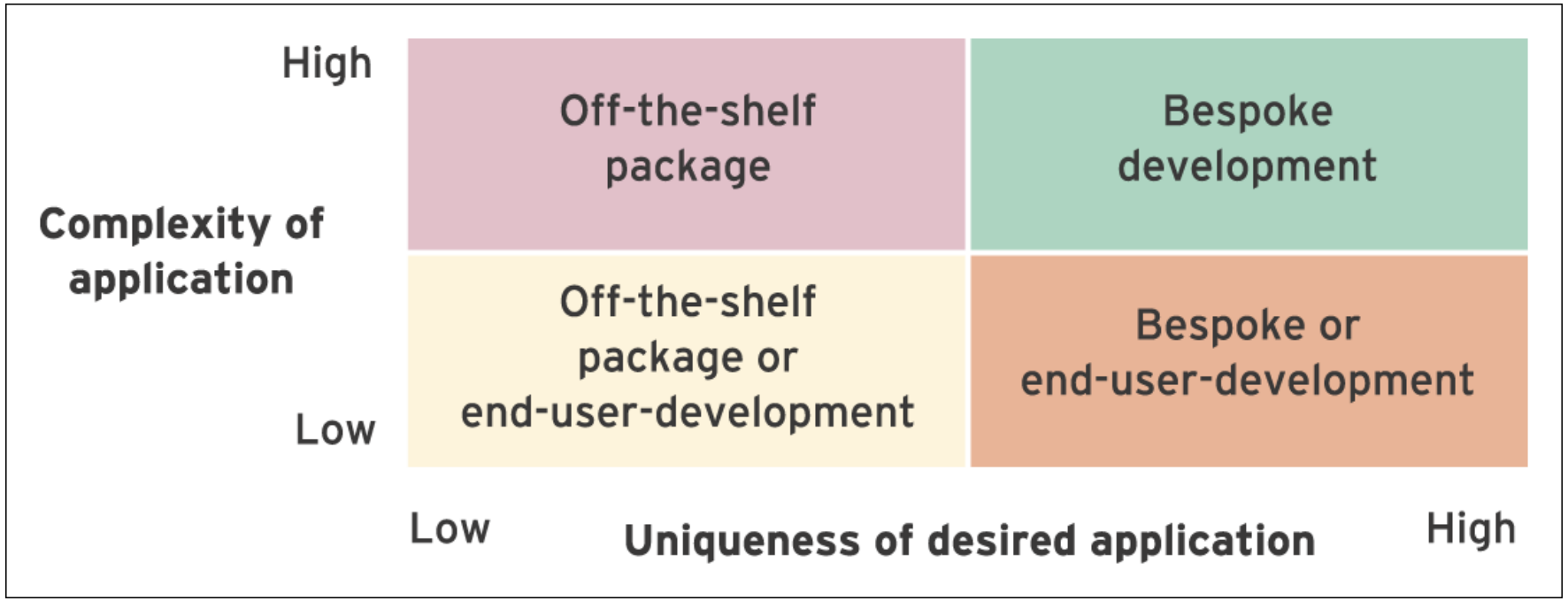


Figure 7.3 Application complexity versus uniqueness

System Development lifecycle

- Process to build a Software.
- Every Project must go through this process.

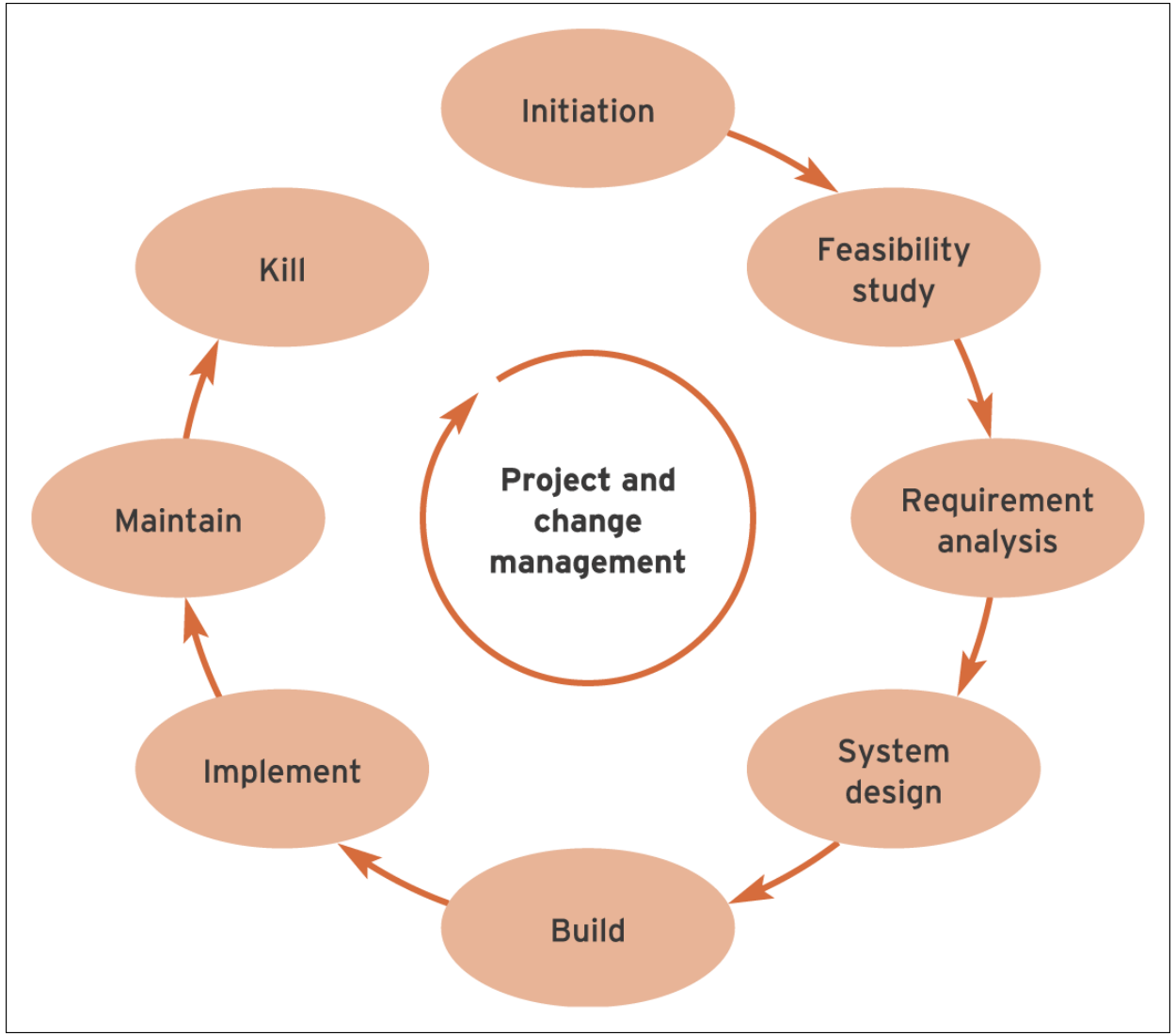
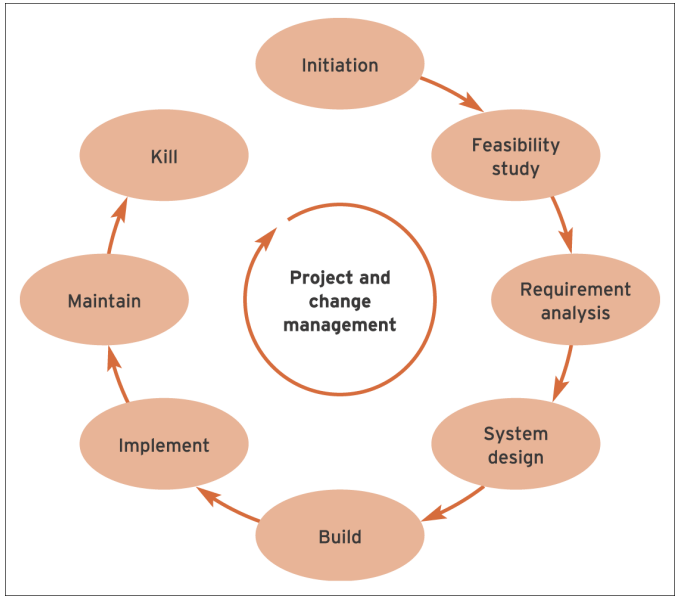


Figure 7.4 The systems development lifecycle (SDLC)

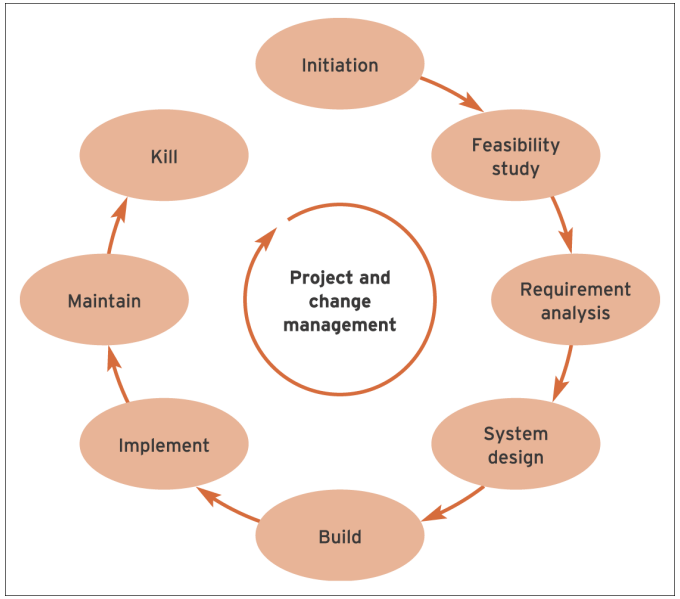
Initiation phase

- **Initiation phase**:
  - The startup phase in an IS development project. Its aims are to establish whether the project is feasible and then prepare to ensure that the project is successful.
- **Initiation phase context**:
  - Input: creative thought and/or systematic evaluation of IS needs.
  - Output: idea for initiation of a new information system.



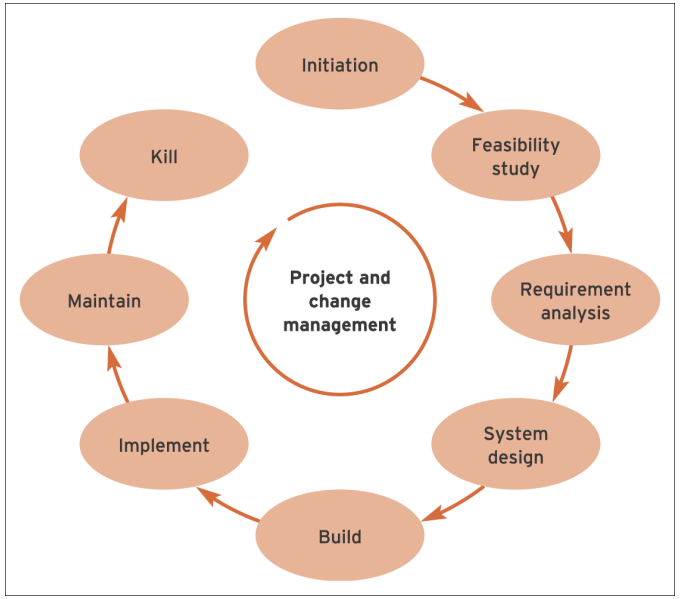
Feasibility assessment

- **Feasibility assessment**: An activity at the start of the project to ensure that the project is a viable business proposition.
- **Feasibility assessment context**:
- Input: idea for initiation of a new information system.
- Output: feasibility report and recommendation to proceed.



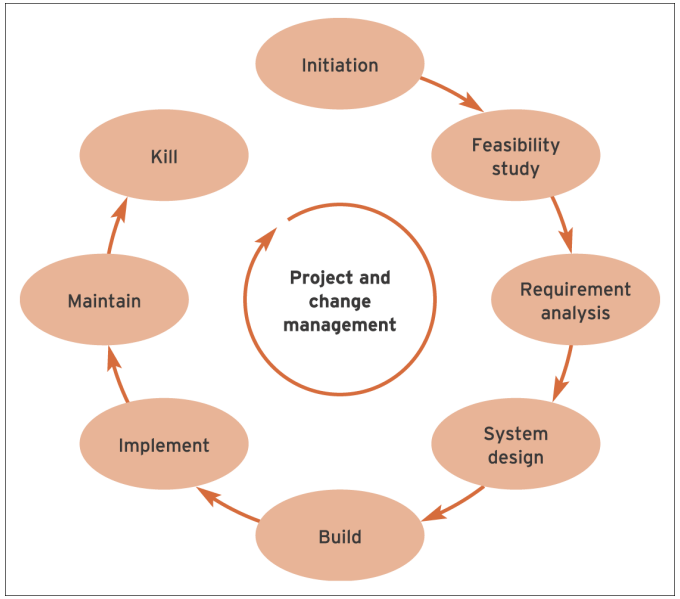
Systems analysis

- **Systems analysis**: The capture of the business requirements of a system from talking to or observing end-users and using other information sources such as existing system documentation.
  - Defines *what* the system will do.
- **Systems analysis context**:
  - Input: terms of reference in feasibility report describing outline requirements.
  - Output: detailed requirements specification summarising system functions.
  - Supported by diagrams showing the information flow and processes that are required.



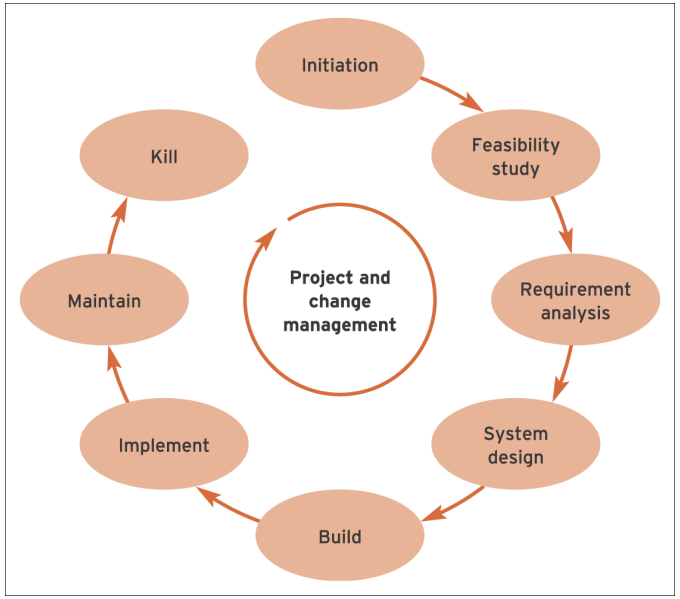
Systems design

- **Systems design**: Defines *how* the system will work in key areas of user interface, program modules, security and database structure and transactions.
- **Systems design context**:
  - Input: requirements specification.
  - Output: detailed design specification.



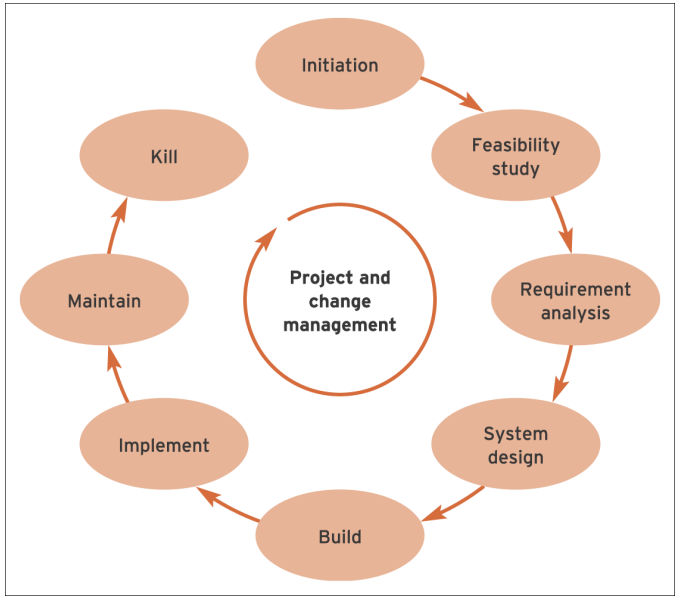
System build

- **System build**: Describes the creation of software by programmers.
  - It involves writing the software code (programming), building release versions of the software, constructing and populating the database and testing by programmers and end-users.
  - Writing of documentation and training may also occur at this stage.
- **System build context**:
  - Input: requirements and design specification
  - Output: working software, user guides and system documentation.



System implementation

- **System implementation**: Involves the transition or changeover from the old system to the new.
- Making sure the hardware and network infrastructure for a new system are in place
- testing of the system
- human issues of how best to educate and train staff who will be using or affected by the new system.
- **System implementation context**:
  - Input: working system, not tested by users.
  - Output: signed off, operational information system installed in all locations.



Learning Outcomes

- **What did you learn ?**
  - ➢evaluate the different alternatives for acquiring BIS.
  - ➢distinguish between the typical stages involved in building BIS.
  - ➢explain the purpose of each stage in building a system.
  - ➢select the best alternative type of approach or methodology for building a BIS.
  - ➢SDLC (System Development Life Cycle)

Questions ?

Anything that you may wish to ask ☺