e-Government
e-Government
Course Introduction and Overview

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e-Government
1 Introduction to the Course

This is a course about governments’ use of information and communication technology. ICTs are almost ubiquitous in public services, from the registration of births to the recording of deaths. Development of new applications and approaches requires vigilance and engagement by all managers in the public services, not just the information specialists to make sure that the most appropriate applications are in place and working well. Unfortunately in both the private and public sectors, developments deliver less than their sales people promise, cost more than was originally estimated and in some cases fail completely.

This course was previously entitled ‘Management Information and Information Systems’. In the early editions of this course there was an emphasis on the hardware and software involved in the field. Over the years as the use of ICT spread through government operations, and in the interaction between governments and citizens and service users, it became clear that success and failure were as much the result of the nature of those relationships as they were of technical issues. The revised title reflects this shift, as well as the developing interest of a wider range of public managers in ICT issues as part of their commitment to public service delivery.

This course therefore seeks to address three issues:

- the great potential of information systems and technologies to create quality services in the public sector
- the reasons behind the widespread failure to achieve that potential
- the possibilities of, and constraints on, closing this gap between potential and actuality through appropriate management.

While the course authors focus on public sector organisations, the course material is also very relevant to the circumstances and staff of non-governmental (NGO) and non-profit organisations. They could equally benefit from more effective use of ICTs and their improved management.

2 Course Objectives

The course objectives are to:

- analyse the role of information in public sector organisations (PSOs)
- explain the latest developments in information technology and information systems and how they apply to PSOs
- analyse why computerised information systems fail so frequently in the public sector, and the constraints on particular types of information system
- examine the different types of information system and related technologies in the public sector: their capabilities, benefits and costs, and their roles in public sector improvement
- demonstrate different ways in which information systems can be better managed
- present techniques for developing new information systems.
In covering these components, three central messages appear throughout the course:

- Information systems (IS) are social systems, within which the non-technical components are the most important. As such, their managers should consider the wider social phenomena that affect and are affected by IS implementation and use.
- Many computerised information systems assume an abstract model of rationality that does not match the reality of many public sector organisations, with important implications for the success or failure of such systems.
- Introducing a new information system requires some degree of organisational change, which also includes managing the associated technology. Greater change could bring more benefits to the organisation but may also mean an increased risk of system and technology failure.

### 3 Learning Outcomes

When you have completed all your work on this course, you will be able to:

- describe, define and handle confidently at a managerial level the latest information technology – and information systems – related terms.
- analyse actual and potential roles of information systems in your organisation in relation to knowledge and decision making.
- diagnose the causes of computerised information systems success or failure in your organisation.
- appropriately incorporate knowledge from managerial practices of technology in the private sector to PSOs.
- make an effective contribution to the management and development of new information systems in your organisation.

### 4 The Course Authors

Since this course was introduced, it has been continuously revised to adapt to developments in the field. The following authors have contributed to this course.

**Amer Jabry** has an MSc with Distinction in Development Economics from the School of Oriental and African Studies, University of London. He has worked on development issues for the past 30 years in over 20 countries. His main areas of work are strategic planning; the application of information and communication technology in development; poverty alleviation programs and public sector reform. He is the Director of E-merge Consulting, a development consultancy.

**Dr José-Rodrigo Córdoba-Pachón** is Senior Lecturer in Information Technology at Royal Holloway, University of London. His research interests concern the use of systematic thinking in understanding and managing information technology and its complexities in organisations. He has an MA (with Distinction) and a PhD in Management from the University of Hull in the UK. His latest books include *Systems Practice in the Information Society*.
(Routledge) and Systems Thinking and E-participation: ICT in the Governance of Society (co-edited with Alejandro Ochoa-Arias for IGI Global).

Dr Richard Heeks is Professor of Development Informatics in the Institute for Development Policy and Management, University of Manchester. He was previously a computer programmer for International Computers Limited and then a schoolteacher in Nigeria, before doing an MPhil on educational information systems at the University of Leicester and a PhD on information technology policy in India at the Open University, UK. He has done consultancy and research on information systems and information technology in China, Cuba, India, Kenya, Malaysia and the UK, and has written a number of books and articles about information technology and developing countries, including Implementing and Managing eGovernment, one of the textbooks used in this course.

5 Study Materials

Your materials consist of the course text – eight weekly units of teaching text, designed to introduce, amplify and question the associated readings. These readings include extracts from textbooks and scholarly articles that are relevant to the particular aspect you are studying. These are reprinted in a Course Reader. The readings are a mix of case studies and analyses of computerised information systems in public sector organisations from around the world. Through them you will learn about a wide variety of experiences and research on public sector information that you can use in your assignments and examination.

Two textbooks that are supplied with the course: Implementing and Managing eGovernment and Systems Practice in the Information Society.

Implementing and Managing eGovernment is written by Richard Heeks, and was published in 2006. It is quite a practical textbook based on many case studies and Heeks’s direct experience with information systems in PSOs. Heeks defines e-government as all uses of information technology in the public sector, but the emphasis of this textbook is very much on the non-technical elements of information systems.

The book is divided into two parts. Part 1 looks at managing e-government through focusing on the non-technical elements of information systems: management of information strategy; management of data security, privacy and quality; managing the people, money and policies that are integral to e-government and dealing with political challenges. Part 2 focuses on what needs to be done to develop and introduce a new e-government system.

Systems Practice in the Information Society is written by José-Rodrigo Córdoba-Pachón, and published in 2010. This book provides some conceptual foundations for the practice of management in the context of the information society. It also offers several examples of human-centred information systems planning, design and evaluation.

While the unit texts will guide you to the specific pages in each textbook that are relevant to the unit’s topic, you are strongly encouraged to read beyond the required pages and explore your textbooks in full.
6 The Structure of the Course

The course consists of eight ‘units’ of work, each with its own core text, set readings and questions.

Unit 1 An Introduction to Information Systems in Public Sector Organisations
1.1 Data and information in Public Sector Organisations (PSOs)
1.2 Defining Information Systems I: The Process Model
1.3 Systems and Systems Thinking
1.4 The importance of knowledge
1.5 The Reality of Information Systems in Public Sector Organisations
1.6 Analysing Information Systems’ Case Studies
1.7 Defining Information Systems II: The ‘Onion Ring’ Contextual Model
1.8 Information Systems and the Organisational Rationality-Reality Gap
1.9 Summary and Review Questions

Unit 2 Information and Communication Technologies in the Knowledge Era
2.1 Introduction
2.2 The Network Society
2.3 The Structure of Networks
2.4 Software Applications
2.5 E-commerce: Supply and Sell
2.6 Emerging Trends in ICTs
2.7 Summary

Unit 3 Knowledge and Decision Making
3.1 Introduction
3.2 Data, Information and Knowledge Revisited
3.3 Knowledge and its Management
3.4 Decision Making
3.5 Summary and Review Questions

Unit 4 People and Information in Organisations
4.1 Introduction
4.2 People as Knowledge Workers
4.3 Defining Organisations
4.4 Management Roles and Management Information
4.5 The Role of People in Information Systems
4.6 The Impact of Computerised Information Systems on Organisations
4.7 Emerging Issues of Information in Public Sector Organisations
4.8 Summary and Review Questions

Unit 5 Types of Information Systems
5.1 Introduction
5.2 Types of Information Systems
5.3 Knowledge Systems
5.4 Structured Decisions: Management Information Systems (MIS)
5.5 Unstructured Decisions: Decision Support Systems (DSS)
5.6 Executive Information Systems (EIS)
5.7 Information System Trends: CRM in the Public Sector
5.8 Summary and Review Questions

Unit 6 Planning and Managing Information Systems
6.1 Introduction
6.2 The Day-to-Day Responsibilities of IS Managers
6.3 Revisiting the Information Society
6.4 Dealing with Transformations
6.5 Engagements
6.6 Unintended Consequences
6.7 A Final Consideration
6.8 Summary and Review Questions

Unit 7 Information Systems Development
7.1 Introduction
7.2 Types of IS Development
7.3 System Planning Revisited
7.4 System Analysis
7.5 System Design
7.6 System Implementation
7.7 System Support
7.8 Closing the Reality-Rationality Gap in System Development
7.9 Summary and Review Questions

Unit 8 e-Government Strategy
8.1 Introduction
8.2 Key Messages So Far
8.3 Defining e-Government
8.4 e-Government in Practice
8.5 Developing an e-Government Strategy
8.6 Summary and Review Questions

7 Assessment
Your performance on each course is assessed through two written assignments and one examination. The assignments are written after week four and eight of the course session and the examination is written at a local examination centre in October.

The assignment questions contain fairly detailed guidance about what is required. All assignment answers are limited to 2,500 words and are marked
using marking guidelines. When you receive your grade it is accompanied by comments on your paper, including advice about how you might improve, and any clarifications about matters you may not have understood. These comments are designed to help you master the subject and to improve your skills as you progress through your programme.

The written examinations are ‘unseen’ (you will only see the paper in the exam centre) and the answers written by hand, over a three-hour period. We advise that you practice writing exams in these conditions as part of your examination preparation, as it is not something you would normally do. You are not allowed to take books or notes into the exam room. This means that you need to revise thoroughly in preparation for each exam. This is especially important if you completed the course in the early part of the year, or in a previous year.

**Preparing for Assignments and Exams**

There is good advice on preparing for assignments and exams and writing them in Sections 8.2 and 8.3 of *Studying at a Distance* by Talbot. We recommend that you follow this advice.

The examinations you will sit are designed to evaluate your knowledge and skills in the subjects you have studied: they are not designed to trick you. If you have studied the course thoroughly, you will pass the exam.

**Understanding assessment questions**

Examination and assignment questions are set to test the knowledge and skills imparted in the course materials. Sometimes a question will contain more than one part, each part testing a different aspect of your skills and knowledge. You need to spot the key words to know what is being asked of you. Here we categorise the types of things that are asked for in assignments and exams, and the words used. All the examples are from CeFiMS examination papers and assignment questions.

**Definitions**

Some questions mainly require you to show that you have learned some concepts, by setting out their precise meaning. Such questions are likely to be preliminary and be supplemented by more analytical questions. Generally ‘Pass marks’ are awarded if the answer only contains definitions. They will contain words such as:

- Describe
- Define
- Examine
- Distinguish between
- Compare
- Contrast
- Write notes on
- Outline
- What is meant by
- List
Reasoning
Other questions are designed to test your reasoning, by explaining cause and effect. Convincing explanations generally carry additional marks to basic definitions. They will include words such as:

- Interpret
- Explain
- What conditions influence
- What are the consequences of
- What are the implications of

Judgment
Others ask you to make a judgment, perhaps of a policy or of a course of action. They will include words like:

- Evaluate
- Critically examine
- Assess
- Do you agree that
- To what extent does

Calculation
Sometimes, you are asked to make a calculation, using a specified technique, where the question begins:

- Use indifference curve analysis to
- Using any economic model you know
- Calculate the standard deviation
- Test whether

It is most likely that questions that ask you to make a calculation will also ask for an application of the result, or an interpretation.

Advice
Other questions ask you to provide advice in a particular situation. This applies to law questions and to policy papers where advice is asked in relation to a policy problem. Your advice should be based on relevant law, principles, and evidence of what actions are likely to be effective.

- Advise
- Provide advice on
- Explain how you would advise
- Critique

In many cases, the question will include the word ‘critically’. This means that you are expected to look at the question from at least two points of view, offering a critique of each view and your judgment. You are expected always to be critical of what you have read.

The questions may begin

- Critically analyse
- Critically consider
- Critically assess
- Critically discuss the argument that
Examine by argument

Questions that begin with ‘discuss’ are similar – they ask you to examine by argument, to debate and give reasons for and against a variety of options, for example

- Discuss the advantages and disadvantages of
- Discuss this statement
- Discuss the view that
- Discuss the arguments and debates concerning

The grading scheme

Details of the general definitions of what is expected in order to obtain a particular grade are shown below. Examiners will take account of the fact that examination conditions are less conducive to polished work than the conditions in which you write your assignments. The criteria here are used in grading all assignments and examinations. Note that as the criteria of each grade rises, it accumulates the elements of the grade below. Assignments awarded better marks will therefore have become comprehensive in both their depth of core skills and advanced skills.

70% and above: Distinction as for the (60–69%) below plus:

- shows clear evidence of wide and relevant reading and an engagement with the conceptual issues
- develops a sophisticated and intelligent argument
- shows a rigorous use and a sophisticated understanding of relevant source materials, balancing appropriately between factual detail and key theoretical issues. Materials are evaluated directly and their assumptions and arguments challenged and/or appraised
- shows original thinking and a willingness to take risks

60–69%: Merit as for the (50–59%) below plus:

- shows strong evidence of critical insight and critical thinking
- shows a detailed understanding of the major factual and/or theoretical issues and directly engages with the relevant literature on the topic
- develops a focussed and clear argument and articulates clearly and convincingly a sustained train of logical thought
- shows clear evidence of planning and appropriate choice of sources and methodology

50–59%: Pass below Merit (50% = pass mark)

- shows a reasonable understanding of the major factual and/or theoretical issues involved
- shows evidence of planning and selection from appropriate sources,
- demonstrates some knowledge of the literature
- the text shows, in places, examples of a clear train of thought or argument
- the text is introduced and concludes appropriately

45–49%: Marginal Failure

- shows some awareness and understanding of the factual or theoretical issues, but with little development
misunderstandings are evident
• shows some evidence of planning, although irrelevant/unrelated
  material or arguments are included

0–44%: Clear Failure
• fails to answer the question or to develop an argument that relates to
  the question set
• does not engage with the relevant literature or demonstrate a
  knowledge of the key issues
• contains clear conceptual or factual errors or misunderstandings

Specimen exam papers
Your final examination will be very similar to the Specimen Exam Paper that
you received in your course materials. It will have the same structure and
style, and the range of question will be comparable.

CeFiMS does not provide past papers or model answers to papers. Our
courses are continuously updated and past papers will not be a reliable
guide to current and future examinations. The specimen exam paper is
designed to be relevant to reflect the exam that will be set on the current
dition of the course.

A current version of the Specimen Exam Paper follows.
This is a specimen examination paper designed to show you the type of examination you will have at the end of the year for e-Government. The number of questions and the structure of the examination will be the same but the wording and the requirements of each question will be different. Best wishes for success on your final examination.

The examination must be completed in THREE hours.

You must answer THREE questions. You must answer Section A Question 1, and TWO questions from Section B. The examiners give equal weight to each question; therefore, you are advised to distribute your time approximately equally between three questions.
Answer THREE questions

SECTION A
ALL STUDENTS must answer this Question

1. You are being consulted by the treasury department of your country to propose a hybrid strategy to implement a national system to share information about individual taxpayers (not companies). The previous consultants failed to involve civil servants and citizen groups, and were deemed as ‘too rational’. The treasury knows that after this course, you can combine systems methodologies with software development methods.

Suggest and justify an appropriate combination of one (1) systems methodology and one (1) software development methodology that you think can help the treasury.

SECTION B
(Answer any TWO Questions from this section)

2. Use the elements of the ITPOSMO or ITPPOE checklists to propose a hybrid strategy to reduce risks of failure when implementing a system for collecting tax online.

3. Answer all parts of this question:
   a. What is e-government?
   b. How is e-government developed traditionally and what are the drawbacks of this form of development?
   c. What challenges lie ahead for e-government managers and developers?

4. Define and discuss benefits and tradeoffs for public sector organisations of the following:
   a. Delegating technology management
   b. E-procurement
   c. Social networking websites

You can refer to examples to illustrate your answers.
5. Answer all parts of the question
   a. Discuss two (2) differences between decision support systems (DSS) and management information systems (MIS)
   b. What features would you introduce to transform MIS into a DSS?

6. What types of customer relationship management (CRM) features would you use as a manager to support public services improvements in a health organisation?

7. Propose a strategy for a public sector organisation to implement and use knowledge management in order to improve its services to citizens. In your answer please consider different managerial levels and styles that exist. You can use an example to complement your answer.

8. Answer both parts of the question.
   a. What are the main threats to the security of data held in a computerised and networked system in a public sector organisation?
   b. What can be done to safeguard this data?

[END OF EXAMINATION]
e-Government

Unit 1 An Introduction to Information Systems in Public Sector Organisations

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Unit Content

Unit 1 introduces the study of management information and information systems in public sector organisations. It discusses concepts and describes models that will be used throughout the course. The unit aims to exemplify the distinction between data, information and knowledge, and to provide an overview of the importance and role of information in public sector organisations. Importantly, it will also do the following:

- provide evidence that information systems are actually social systems rather than technical systems
- describe and analyse the gap between the positive potential and the often negative reality of information system development in public sector organisations.

Learning Outcomes

When you have completed your study of this unit, you will be able to:

- distinguish between data, information and knowledge
- describe the role of information in public sector organisations
- define what an information system is, and describe its key components through two different models: the process model, and the ‘onion-ring’ contextual model
- critically assess case studies and experiences on information systems
- explain and use the concept of the rationality (how things should be) – reality (how things are) gap within organisations and the role of this factor in the successful implementation of information systems in public sector organisations
- begin to describe how the rationality–reality gap can be closed.

Readings for Unit 1


Course Reader

Subhash Bhatnagar (2000) ‘Social Implications of Information and Communication Technology in Developing Countries…’
1.1 Data and information Public Sector Organisations (PSOs)

Worldwide, we live in societies where data and information have become essential assets and key elements of our economies and our institutions. Although these terms can be used inter-changeably, it is important to distinguish between them when talking about information systems and communication technologies.

For now let us say that data is the electronic representation of facts and events that we want to keep record of. Information and communication technologies (computers, networks, mobile phones, scanners, etc.) or ICTs allow us to record, store, transfer and send data. In our daily lives we continuously manage data. We keep telephone numbers, bills, receipts, account balances, medical prescriptions, etc. Just have a look at what you have in your pocket or wallet – there is a lot of data in it!

When such data makes sense to us, when it is something meaningful and is not just a stream of numbers, names or letters, we can begin to think of it as information. What also emerges is that we use information for something purposeful – e.g an activity. We share it, manage it and even protect it from others. The data ‘speaks’ to us, we want to keep it, or do something with it. We can for instance pay a bill from its invoice, or buy medicines with a prescription, or use our passport to identify ourselves.

The rise of information and communication technologies (ICTs) has changed dramatically our daily activities; these technologies enable the processing of information in different forms (storing, gathering, modifying, checking). In the 1980s a key turning point for many organisations was that of gaining advantage over others by implementing ICTs and using them to improve their margins over products and services; for instance, the checkouts at supermarkets became points of collection of data which generated information about our consumption habits, which was then used to offer us discounts or promotions; all of this was possible thanks to the availability of technologies called points-of-sale (POS) systems. Nowadays, we can even do the checkout ourselves (with new technologies that read the prices of the products we are buying).

This rise is still continuing, which means now that many Public Sector Organisations (PSOs) could become still more efficient and transparent in their processes – in other words, become citizen-centred; with technologies, we are now able to pay our taxes online, or register our companies or (if not yet, soon) get instantly issued a birth or marriage certificate. As you will see in studying this course, aligning the rhetoric and reality of this – in other words, enabling information and technologies to support meaningful activities – is a key challenge for those individuals developing and managing information systems and related technologies. Closing the gap between these two terms in practice is what concerns us here.

An appropriate term that helps us to bring the potential of ICTs to improve service (in profit and non-profit sectors) is that of an information-system. A brief definition of an information system (IS) is a set of components, people and processes that, often supported by ICTs, help organisations accomplish their purpose by supporting the activities of their members. Here we have
the notion of a system as a ‘whole’, composed of different (human, non-human, technical, non-technical) parts, which is designed and used purposefully.

Another, and similar definition of an IS is this:

- …a system of human and technical components that accepts, stores, processes, outputs and transmits information. It may be based on any combination of human endeavours, paper-based methods and information technology (Heeks, 2001: 15).

In practice, an information system can operate in different ways and thus it can fulfil different purposes for different groups of individuals. As simple as it sounds, very often this is not the case. It is the technologies (ICTs) and what they can do that often drive people, rather than the other way round or a synergy between the two. Consider, for instance, the following examples:

1 A Ministry of Education lacks information on the most basic aspects of its work. It does not know how many:
   - schools are currently operational
   - pupils are currently studying in each school
   - teachers are currently employed by the Ministry
   - pupils studied and teachers were employed in previous years.

Moreover, Computers (ICTs) have been provided to administration headquarters with the latest desktop software applications (more on this in Unit 2) for word processing and financial calculations. However, both applications and computers are waiting to be ‘commissioned’ to the schools that need them most.

As a result, there exists a situation of ‘planlessness’, in which:
   - there is no alternative but to allocate resources (finance, staff, equipment, etc.) on the basis of guesswork or patronage
   - budgets and payrolls are bloated by the presence of ‘ghost schools’ and ‘ghost workers’ – fictitious entities created to claim public funds
   - efficiency, accountability, transparency, monitoring and evaluation are unworkable concepts (Dabor 1996)
   - ICTs are underutilised, and before we know it, they become obsolete.

2 A Ministry of Agriculture initiated a programme of collection and processing of information about:
   - farmers’ locations and household details
   - land holdings
   - crops and livestock production
   - loans and repayments.

As a result, planning, allocation and evaluation of extension services were improved, as were loan and land management. The organisation was therefore able to carry out its work more effectively, and to make more efficient use of its limited resources (Torres and Tanchoco 1988). There are also plans to implement a software application that helps to speed up the processing and automation of some of the information registration.
Review Questions

Looking at similarities and differences between the cases presented:

- Can you describe the data and information in each of the above?
- What features does an information system have or should it have in each?

Jot down your thoughts.

By now you should see that the core of success or failure of efforts to implement information systems and some of the technologies supporting them does not reside with the technologies, but rather in the ways in which we conceive of an information system. At the root of the problem there is what is considered information in relation to what people do rather than from wishful thinking of what they should be doing. In other words, we need to consider what is information, and not simply electronic data. The absence of information or its notion necessarily causes a breakdown in most of an organisation’s management functions. On the other hand, the addition of useful and timely information can energise an organisation to perform much better than it previously did; in that case, the use of ICTs is much more appreciated and valued as a tool to help to manage information.

All this may seem self-evident, but organisations are still in the process of realising the importance of information and the role it can play. Most medium and large organisations started life with a finance manager to manage financial resources. Over the past thirty years or more, these organisations have also taken on a personnel or human resource manager to manage the human resources (i.e. the people). But the development of the role of information manager, responsible for managing the organisation’s information, is comparatively recent in public sector organisations.

We contrast this with private sector organisations. More and more of these organisations are appointing CIOs, Chief Information Officers, and CKOs, Chief Knowledge Officers; these people have the responsibility of looking after information as an organisational asset. They need to know how ICTs can support information management so that employees and users get what they need to carry on with their daily activities. In terms of knowledge (more on this later), having information can lead us to discover new opportunities to better do what we do in organisations.

A survey of UK private sector companies found that – even in the mid-1990s – they half considered their information more valuable than their employees (DTI 1995). The private sector’s lead in this field is ironic because the organisational use of information essentially began in the public sector. Years ago, census data became information in many countries, fuelling the definition of policies and the subsequent provision of public services – as happens to this day.

This example can lead us to think that, given its size and the nature of its work, the public sector is the single largest collector, user, holder and producer of information. Information is a central resource for all staff levels and for all activities, from planning to implementation to monitoring and evaluation. In many public sector organisations (PSOs) today, we still see a
lack of concern with understanding what is information and what is not.

According to Heeks (2001), PSOs produce, collect and use four main types of formal information:

- information to support internal management
- information to support public administration and regulation
- information to support public services
- information made publicly available.

Information supporting internal management includes information about staff for personnel (or human resource) management, and information about budgets and accounts for financial management.

Information supporting public administration and regulation includes records of the details of the main ‘entities’ in any country: people, business enterprises, buildings, land, imports/exports, etc. It is used for a variety of legal, judicial and fiscal purposes amongst others.

Information to support public services differs according to the particular public service. Examples include health (e.g. patient records), education (e.g. school staff records), transport (e.g. freight movement information) and public utilities (e.g. customer billing information).

Information made publicly available includes ‘public relations’ information on government opinions and activities disseminated through public meetings, press, radio and television; details of laws, regulations and statutes; information about budgets and decision making provided for purposes of accountability; details of information collected by government such as statistical reports.

Reading

Please read the Introduction (pp.1–2) of your textbook by Heeks, and make particular note of:

- how the textbook is structured
- the five core themes of this textbook
- how the textbook defines e-government.

At this point you could usefully take 20–30 minutes to look at the whole textbook. As you go through its pages and by reading the chapter and section headings and observing the diagrams and textboxes, you will get an idea of the framework and content of the book. Mark or quickly read anything that you find particularly interesting, but don’t stop until you have glanced at the References and Index sections.

You have now got an overview of the textbook and this will help you to study it. (You can use this technique for any large document you need to read.)

1.2 Defining Information Systems I: The Process Model

At this point we hope you are able to understand the meaning of information and its value in relation to supporting organisational activities, as well as how information systems contribute to the latter. In practice, and with the advent of information and communication technologies, you will find that
an information system encapsulates a number of activities. The following diagram illustrates a basic operation of an information system. Please bear in mind that this is a useful and correct way of visualising an IS, but there are also other ways they can be depicted.

Figure 1.1  A Process View of an Information System

This definition implicitly applies more to formal structured information (e.g. citizens’ dates of birth) than informal unstructured information (such as who is in political favour). We will look at the difference between the two types of information in subsequent units. For now, it suffices to say that the definition makes specific mention of non-information and communications technologies (ICTs) components. This is important. ICTs are critical components of most modern information systems, and often they are regarded as the solution to information management in the public sector and elsewhere. We will be analysing this view in detail throughout this course. A good starting point, however, is always to remember that you do not need technology to have a successful information system.

In short, we will work through these eight units, to learn about:

- the reality of information systems in PSOs and why they often fail to meet the objectives they were designed to achieve (Unit 1)
- a managerial perspective of how different ICTs have emerged and how they can help to generate, share and use knowledge in public sector organisations (Unit 2)
- knowledge and decision making in PSOs (Unit 3)
- people and information in organisations (Unit 4)
- information systems and applications (Unit 5)
- managing information systems planning and evaluation (Unit 6)
how to design and implement an information system taking all the above into account (Unit 7)

how e-government can support public sector reform efforts (Unit 8).

We will first start with an introduction to information systems.

### 1.3 Systems and Systems Thinking

We just mentioned the term information system. Very often in our daily activities we use the word ‘system’ to mean a collection of elements that are assembled for a particular management purpose: transport, information, health, tax, procurement, etc. We also use the word when we perceive the operation of something to be more complex than meets the eye. How can we consciously apply a different way of thinking, using systems, to our traditional (reason- and fact-oriented) ways of going about problems?

Systems thinking encompasses a collection of ideas, concepts and methods that have been around for a number of years. Many people consider this a scientific discipline, whereas others conceive of it as a subsidiary of disciplines such as management, computing and psychology. In this course we will use some of the ideas and methods of systems thinking applied to management problems, many of which relate to the planning and evaluation of information systems and technologies as well as the management of change. In public sector organisations (PSOs) there is evidence that systems thinking has been applied to facilitate service improvement and learning about policy making and implementation. Two books that introduce this well are Jake Chapman’s *Systems Failure* and John Seddon’s *Systems-Thinking in the Public Sector*, cited in the References section of this unit.

A more practical account of systems thinking in relation to complex information systems and technology problems is the textbook we use here by José-Rodrigo Córdoba-Pachón (2010). Here you will find a number of experiences of thinking and acting *systemically* – in other words, by considering and intervening on different aspects in a situation which, if adequately treated, could help us to make more sense of information, systems and technologies in public sector organisations (PSOs).

### Reading

By way of introduction, read the section on systems thinking, pages 5 to 7, of Chapter 1 in the textbook by Córdoba.

Focus particularly on the terminology, and jot down your answers to the following questions:

- What could be different if we think in terms of systems as opposed to thinking linearly in terms of cause-effect?
- What opportunities and constraints do you see to use systems thinking in your organisation and PSOs in general?
As you will have seen from our treatment of issues in public sector organisations in relation to information systems, applying a more systemic way of thinking can lead us to recognise how knowledge can be better generated, shared and applied in organisations in conjunction with ‘rational’ orientations on how to develop information systems. We will touch upon this complementarity between approaches throughout the course, but next we turn to knowledge as a key topic in the management of information and systems.

1.4 The Importance of Knowledge

The public sector, in all countries, is under considerable pressure to reform itself, improve governance and provide better, more responsive and more accountable services to citizens – in other words, to become more citizen-centred, whatever this means in a particular context. Most public sector reform efforts focus on:

- improving public sector resource management
- increasing efficiency
- decentralisation
- improving democratic processes
- increasing accountability (Heeks 2001).

You may be familiar with these from other courses within the Public Policy and Management degree, and most readings and media articles about public sector reform invariably mention some or all of these areas. This is indeed a systemic problem, as there are many issues to tackle!

Given the central role of information in the work of PSOs, the advent of information systems as well as of information and communication technologies (ICTs) appeared to have the potential to make all the ideas of public sector reformers a reality. The expectation was, and still is, that technology-based information systems have the potential to enable the public sector to carry out more reforms, cheaper, quicker and better; and allow public sectors to implement reforms for the first time, which in the past were prohibitively complex or expensive. Now, however, there seems to be a more realistic understanding that technology-based information systems are simply tools to achieve reforms, and there is thus a need to see this as a continuous process, given that conditions change and so do the expectations of civil servants and service users among others.

Despite these expectations, and looking at reforms implementation as a continuous process, it can be said that in many organisations it is still not clear who defines what is to be done (in relation to reforms), given existing and often ‘entrenched’ or ‘outdated’ ways of providing services. Neither is it fully clear how to implement policies for public sector organisations, and ultimately for citizens. There needs to be an intermediate layer of discussion, debate and definition to realise the potential of information systems and technologies. As you will see later, there is a continuum of approaches to implement information systems – from the very ‘rational’ to the very ‘real’; both of these are required to increase chances of success in implementing
information systems in PSOs. Our aim is to combine concepts and ideas so as to enable you to see the whole picture of a situation, as well as being able to intervene in it. We now turn our attention to a potential case of ‘failure’.

📖 Reading

Please turn to the Course Reader and study the articles on websites from the BBC (2007) and The Guardian (2010).

Your notes on the reading should cover what you think in relation to the following:

- why websites were set up in the first place
- what goals are driving the initiatives in both cases to close them
- why websites might/might not have been successful.

The case of UK government websites that you have just read about contains many valuable insights, and in this section we will refer to two of them. First, the idea of setting up a website as an information system requires a deeper understanding of what information is going to be valuable for those using the system. And second, these websites might contain information that many users can now see as essential to carry on with their daily life activities; their realities might not have been considered. Several aspects need to be addressed if we want to better understand and manage information systems and organisations. In order to start doing that, we need to complement what we know about information with a very useful notion – the distinction between information (or data) and knowledge.

In simple terms, knowledge can be defined as ‘justified belief’, something we use to get on with our lives, or something we acquire when we have a problem we want to solve. This notion has been extensively used in the private sector alongside the management of information systems to account for the use of information to discover new opportunities or solutions to existing problems. Knowledge can thus be regarded as an intermediate notion between policy and information, between reform and activity, between a system and its effective use by people. It is through knowledge that civil servants can become better users of information systems and technologies, because they can know where, when and how to use information to serve their citizens. Knowledge of how things can work better is a key element to ensure that information-systems adequately support organisations.

From the above, you can begin to see that there is a mutual relationship between knowledge and information. As previously stated, knowledge of how to carry out an activity can help managers to identify the necessary information that needs to be managed by them or by an information system. On the other hand, knowledge can be derived from looking at information – for instance, by looking at information on a patient’s history a doctor can know if a prescribed treatment has been effective or not; or by looking at information about services used by citizens one could get to know their preferences and problems. Later on in this course (Unit 3) we will deepen this into the topic of knowledge management as an aide that can help
facilitate positive organisational change, as well as the implementation and use of information systems and technologies (ICTs) in the public sector.

1.5 The Reality of Information Systems in Public Sector Organisations

So, with the above definitions of data, information, information systems, systems-thinking and knowledge in mind, and the potential benefits of systems now being cheaper, more available, quicker, and better developed, PSOs should be able to continuously manipulate information to their benefit and to the benefit of the citizens they serve!

Significant financial and human resources are continuously being invested in information technology and systems in PSOs around the world because they are perceived as solutions to both current and new problems that affect the public sector and societies overall. We now live in a knowledge economy that should fuel opportunities and benefits (more on this in the next unit).

As stated by Joseph Stiglitz, Chief Economist of the World Bank in 1999:\footnote{Available at \url{http://akgul.bilkent.edu.tr/BT-BE/knowledge-economy.pdf}, accessed in January 2013}

Knowledge and information is being produced today like cars and steel were produced a hundred years ago. Those, like Bill Gates, who know how to produce knowledge and information better than others reap the rewards, just as those who knew how to produce cars and steel a hundred years ago became the magnates of that era… Knowledge is different from other goods: it has many of the central properties of a public good, indeed of a global public good.

...Government does have a role – a role in education, in encouraging the kind of creativity and risk taking that the scientific entrepreneurship requires, in creating the institutions that facilitate ideas being brought into fruition, and a regulatory and tax environment that rewards this kind of activity [creativity and wealth creation]… These changes in economic institutions have counterparts in the political sphere...

Given this type of imperative – that is, the possibility of advancing societies through knowledge and the availability of information and communication technologies (ICTs) in recent years – it would be logical to assume that information systems recently developed or updated are successful in delivering what they were designed to do and that citizen-centred visions are now a reality. What has happened? On average, do new or updated information systems in PSOs succeed or do they fail, and why?

🔍 Review Question

Take a moment to think about at least four public-sector information systems you have come across. They can be big or small, ranging from a small application to help in budgeting to a full suite of programmes and devices to keep information flowing through. Systems may be part of an organisation you have worked in, or maybe you have had exposure to them directly as a citizen, or indirectly through media reports.
For each system, jot down what you think the objectives of the system are, and whether the system (in your view or the view of someone else) is successful in achieving those objectives.

While there is no definitive answer to the question above, indications are that the formal use of information systems in PSOs today, especially in developing countries, has had mixed results. Indeed, the first sentence in Chapter 1 of Heeks’s textbook bluntly states: ‘Most e-government projects fail’.

In this section we will begin to look at the success and failure of information systems in PSOs, and why these successes and failures happen. This analysis will lead us to a new definition of information systems, which emphasises the non-IT components. This definition is quite different from the process model definition given above. This new definition will, in turn, lead us to consider how the gap between what should happen in an organisation (or what is rational) and what actually does happen (an organisation’s reality as lived and influenced by many and different individuals) is often the key to explaining the success or failure of systems.

First, we will look at how common information system failure is in PSOs, and we start with some reading.

Reading

Please read the Economist article: ‘Government and IT – Your health depends on it’ in your course reader.

Make notes as you read on the following:

- Which of the projects listed in the table in the article were total failures, and which were partial failures?
- The root causes mentioned in the article for the failure of large public sector information system projects in general – are these related more to technical factors or to other factors such as data, people, management and political problems?
- Some similarities with what has been regarded as ‘failure’ in government websites as stated in your previous readings of this unit.

While the article relates to information system failure in the UK, most other countries have similar experiences. Consider this quote from Gartner, a leading market research agency for information technology and systems:

> More than 60 percent of all e-government initiatives either fail or fall short of expected outcomes, according to Gartner, Inc.’s Executive Programs (GartnerEXP).

> The average national government has 160 different departments, according to GartnerEXP. Digital government initiatives, spanning multiple agencies and possibly multiple levels of government, require more political capital, complex governance structures, multilevel funding mechanisms and relationship skills than projects contained in a single organization.

> ‘The many levels of government, each with its own laws, codes and policies, add to the complexity, resulting in large, and thus risky, e-government endeavors that try to cover too much ground’, said Judith The Economist (2002) ‘Government and IT – Your health depends on it’, reprinted in the Course Reader.
Carr, vice president and senior program director with GartnerEXP’s government research.

Excerpts from http://symposium.gartner.com/story.php.id.1367.s.5.html

Information system failure in PSOs, and especially that of new, complex systems designed to ‘revolutionise’ some aspect of public service delivery is very widespread. But what do we mean by ‘failure’?

Heeks identifies two types of failure:
- total failure
- partial failure.

Total failure is reached when a system has to be abandoned – often after considerable expense has been incurred. The systems for benefits payments, immigration applications and the Ministry of Defence in the table in The Economist’s article fall into this category.

Partial failure is reached when original goals were not achieved as planned within a set time scale. Most systems will have financial goals (e.g. cost of system/anticipated cost savings) and performance goals (e.g. x transactions in y time over z locations). If these are not achieved in the specified time (e.g. cost of system more than anticipated; or performance targets and cost savings achieved but a year later than planned), then the system has partially failed.

Partial failure is also a consequence of undesirable outcomes occurring in completed projects. Large information systems are very complex and it is not possible to anticipate all the outcomes from their introduction. If some of these unanticipated outcomes have adverse effects on the organisation using it or on citizens, then the system has partially failed even if it met all its original objectives. Partial failure can be addressed if appropriate evaluation takes place at appropriate times of a project. As you will see in Unit 6 of this course, the role of information systems planning and evaluation becomes crucial to identify and modify project goals according to the realities of the project as well as of the organisation that undertakes it.

In understanding failure, it might help to remember what we said about systems thinking and how situations relate a number of different issues. With this in mind, failure could be seen as a systemic problem, requiring us to go to the causes rather than focusing on the symptoms. Moreover, we can begin to see from The Economist’s article that the reasons given for these failures are largely non-technical:
- lack of clear ownership and senior management support
- a multiplicity of political objectives leading to a lack of clear objectives
- projects that are too ambitious for the complexity of PSOs’ environments
- contracts awarded on price rather than on ability to deliver
- a preference for secrecy
- resistance to change

and, most importantly,
a focus on the technical aspects of the project to the detriment of the change management aspect of the project.

From now on, you might start thinking how we can then capture and deal with these aspects in our practice as information systems managers or users.

The realisation that non-technical components play such an important role in the success or failure of an information system – so that information systems can be considered ‘social systems’ involving technical and non-technical issues – is one of the keys to much of the rest of the course, and to dealing with information systems in your own organisation.

The categories of failure listed above cover a very wide range, and each is very precise. If we think that there could be an excessive focus on technical aspects (typically manifested in a sense of trust that ICTs will solve everything), then it is no surprise that the overall findings are that most e-government projects fail.

But it is not all bad news. At certain times in the implementation of an information system, the focus needs to be on its technical aspects. Moreover, advances in information systems and technology have been around for long enough for lessons to be learned and for successes to occur. For a good proportion of information systems, the problems are fixed, the costs are absorbed and the use of the systems become part of the everyday reality of their organisations – speed, quality and agility in activities are achieved. The trick is then to know when to use what sort of approach, and enable organisations to include their own values and concerns in the process.

In line with the above, it is worth remembering that a system can also produce some positive unintended consequences, which can result in empowerment for individuals and the pursuit of additional opportunities for improvement. The next reading looks at some examples of IT based information systems in Asia.

Reading

Please read the whole of Bhatnagar’s article, ‘Social Implications of Information and Communication Technology in Developing Countries: Lessons from Asian Success Stories’, paying particular attention to the case study of the milk collection societies on page 4.

As you read, make sure your notes enable you to answer the following questions:

- What are the underlying reasons given for the success of the information systems described in the paper?
- Are these reasons based on technical or non-technical IS components?
- What is the importance given to knowledge and information?

Again you can see that the reasons given for the success of information systems are largely non-technical: explicit government policy support; strong leadership; entrepreneurship and, most importantly, adapting the technology and the system to the reality of the milk farmers are all mentioned.
Of course, it might be easier to rationalise these elements once a system is implemented (with success or failure). But before we start a detailed analysis of some of the non-technical components of failure, we need to make a small detour to look at how information system case studies are written and how they can be analysed. This will help you to critically examine the many case studies you will read during this course, and more easily extract their main points.

1.6 Analysing Information Systems Case Studies

The fact that so many information systems are failures may come as a surprise. After all, most of the stories about information systems and technologies that one reads about in the media appear to be successes. This suggests that there is a problem with the reporting of IS case studies.

In part this is because failures are under-reported whilst successes are, if anything, over-reported. Just imagine the situation in your own organisation. One IS project has been a complete mess; a second has led to beneficial outcomes. If you had the opportunity to write about an IS project or present a talk or discuss it with an outsider, which project would you be likely to choose? Of course, you will pick the success, which reflects well on you and your organisation, rather than the failure, which reflects badly. The reported ratio of failures to successes is therefore generally less than the real ratio.

However, it is harder for public sector IS failures to escape attention than it is for those in the private sector. Public sector information systems are subject to the scrutiny of the Public Audit (or equivalent). In some cases, the public (or the media on their behalf) are also involved, being concerned about uses of government revenue. Such mechanisms are not foolproof, however, and there are many other reporting channels (annual reports, conferences, and the like) where scrutiny is light or non-existent. Therefore, when cases are reported, one has to read them carefully since many are not quite what they appear, as the following exercise illustrates.

✍ Case Study Exercise

Read through the following quotes, taken from case study reports of public sector information systems. As you read, consider the following question:

- Do these represent actual full case studies of the benefits of computerisation, or are they talking about something slightly different?

1. ‘Significant advantages from computerization can accrue in the development planning function. Each district (population of about one million) spends approximately 100 million rupees in a year on various development programmes. Computers could be used effectively for deciding optimal location of the new infrastructure facilities being created through such investments. Computers could also be used to monitor the progress of implementing such projects to cut down delays and over-expenditure’ (Bhatnagar 1992:35–36).

2. ‘In Morocco, the Public Administration Support Project is designed to improve, among other things, national budget planning and monitoring’ (Moussa and Schwar 1992:1741).
3 ‘The Department of Social Security embarked on a computerisation project in order to business re-engineer its information and administrative systems. The new system is constructed around the personal tombstone data at the Public Registry. It will provide comprehensive social security benefit claim and payment facilities’ (Management Systems Unit 7, 1993:57).

4 ‘An interesting experiment has been undertaken in five districts of India to computerise land records. This is a very high volume transaction processing system’ (Bhatnagar 1992:35).

These examples illustrate common ways in which material reported might diverge from full case studies of actual experience. The first quote addresses the potential of computerisation rather than the reality (note the use of the word ‘could’). The second and third quotes discuss systems that are planned but not yet implemented (note the use of the terms ‘is designed to’ and ‘will’). The fourth quote reports on an experimental, or pilot, system rather than full implementation (note the use of the word ‘experiment’).

This is what we mean by the rhetoric (rationality) and reality of information systems and the resulting gap between these two, which can lead to information systems failure. None of these examples reports an actual full case study. Hence, we can give little, if any, weight to benefits listed in the ways illustrated. During this course we will explore ways in which gaps between these two can be closed with the help of concepts, ideas and techniques.

Readings

Look again at Cordóba’s textbook, pages 1 to 5, in particular to the three different types of phenomena about the information society. We will touch upon these in the next unit, but for now you can see how the case studies on information systems could refer to one of these three phenomena:

- transformations
- engagements
- unintended consequences.

With these ideas and examples in mind, have a quick re-read of the Bhatnagar (2000) article. You will notice that despite the sub-title: ‘Lessons from Asian Success Stories’, the last paragraph on the first page contains an acknowledgement of the failure of the CRISP and DISIC systems, while pages 2–4 are full of ‘coulds’, ‘ifs’ and ‘wills’.

What can we say about failure in relation to:

- how transformations were handled?
- if there was an adequate degree of engagement (or participation) with people?
- whether unintended consequences could have been foreseen and managed?

This will give you food for thought about how case studies are reported and how they can be analysed in terms of the phenomena to be observed.

Finally, when a report does concern a full system that has actually been implemented, one may still question who has written the report, and whether the whole picture is given. Often, the writer is not a disinterested
observer, but the designer and implementer of the system described. As such, he or she is undoubtedly keen to portray the system as a success with plenty of benefits, and is unlikely to wish to describe any shortcomings or problems experienced in its implementation. We should therefore only place limited value on case studies that are:

- **written by someone with an interest in the system** — do note, though, that occasionally the interest may be negative, with the writer having a desire to malign the system
- **written in only positive terms** — experience tells us that even the best projects have difficulties. We should be sceptical about apparently problem-free and unqualified success stories.

This leads to the wider, and very important, point that in order to understand information systems, we need to understand the different objectives, interests and perspectives of the different people or institutions involved – that is, we need to understand the stakeholders or actors. We will return to this point repeatedly during this course.

In summary, when reading or hearing about information systems projects and experiences, we must apply our critical judgement in order to:

- find out whether a system has been fully implemented, or is just a plan or a pilot scheme
- find out who the writer or presenter is, and if they have a vested interest in it
- think about who the different stakeholders are, and what their different motivations might be
- identify some elements of time that could allow us to trace the unfolding of the project as well as its partial or total success/failure
- remember that for every reported success, there is often more than one unreported information systems failure.

A practical technique to help you apply your critical judgement is to realise that the majority of case studies consist of most or all of the following seven elements. In analysing a case study, you need to:

1. identify the organisation in which the case study is taking place, giving details about it (its size, what it does, how and where it operates, etc.), the environment it operates in and, often, quotes from some of its staff
2. highlight the problem or the opportunity that the organisation wishes to respond to through a new or updated information system
3. describe the objectives the new or updated information system is supposed to achieve
4. describe the implementation of the new or updated information system
5. describe the immediate outcome of introducing or updating the information system
6. describe the actual outcomes and impact(s) (short and medium terms) of the information system on the organisation; these will only come to light after some time has elapsed from the introduction of the system
7. analyse the reasons for the outcomes and impacts of the system from a position of hindsight and better knowledge.
Consciously looking out for these seven elements whenever you read a case study will help you to analyse it more thoroughly, extract what it is really saying and identify gaps in the case study story, whether intentional or unintentional. This set of ideas will help you to analyse the case studies that we use throughout the course and, in particular, how systemic thinking is applied in information systems (Unit 6).

### 1.7 Defining Information Systems II: The ‘Onion Ring’ Contextual Model

From the case studies and readings so far, you will have started to realise that information systems consist of a variety of technical and non-technical factors, and that the latter often play the key role in determining the success or failure of the system. What we need therefore is a model that identifies all of these factors, so that we can think about them systematically whenever we analyse an information system.

Our first model of information systems, presented in Figure 1.1, was process-oriented and dynamic. It showed how information flows within an information system, with a focus on the ‘accept, store, process, output and transmit’ part of the definition. Drawing on the evidence of the case studies, we can begin to develop a second model of information systems that is more static and context-oriented, with a focus on the human and technical components of an IS.

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**Reading**

Please read pages 3–7 (up to section 1.2) of Heeks’s textbook.

- In your notes, pay particular attention to the following.
  - The ‘onion ring’ diagram on page 5. This may be one of the most important diagrams in this course. Place it in a prominent position in your place of study. You will find it invaluable for the duration of your study of the course.
  - The seven key items listed in the ITPOSMO checklist, which are also mentioned within *The Economist* article and the Bhatnagar paper.

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There are four fundamental points about information systems that we can take from this reading. They are:

1. *Information* lies at the heart of all information systems.
2. The *minimum* set of factors necessary to describe an information system is the information technology used plus the information it manipulates plus the nature of the people who use it plus the processes that the people have to use plus the management responsible for the maintenance and use of the information system.
3. But this minimum set is not sufficient for a full understanding of an IS. All information systems operate within two contexts: the *organisational context* in which the IS is located, and the wider *environmental context* in which the organisation itself is located. The drivers and pressures to use modern information systems and technologies for public sector reform originate from these two contexts.
The consequence of the above three points is that: information systems are social systems and not merely bits of technology wired together, as often portrayed. Information systems are rooted in a context of people and social structures, and are themselves made up of people and social structures, in addition to technology.

These four points together can be represented by Heeks’s ‘onion ring’ diagram, which we repeat below because of its importance. What are the implications of this model? When ‘reading’ the diagram, note that each ring contains all the factors within that ring, plus all factors within all inner rings, and is affected by all elements within all outer rings.

Figure 1.2 Full model of information systems in PSOs (adapted from Heeks 2001)

An implication of adopting the approach that information systems are social systems is that we explicitly reject other views of information systems. In particular, we reject views of information systems that focus mainly on the information technology of the equation that fail to acknowledge the role of organisational and environmental contexts. Such views can be widespread – for example, among IT vendors and IT professionals. These groups normally have great difficulty in understanding, talking about, and working with the comprehensive nature of information systems. They tend to focus on just the technology, and this has been identified as a component of many information systems failures.

Managers too, often make the mistake of focusing solely on the technology although, of course, some understanding of technology is useful when introducing information systems. (We will look at technological trends in Unit 2.) More important (and admittedly, more difficult) is to understand your information needs, your colleagues, your organisation and your environment.

Having adopted a model in which the context for information systems is important, the next implication is a caution in generalising from one experience to another. We should particularly guard against two common generalisations. First, that something which has worked in the private sector will work in the same way in the public sector. Second, that something
which has worked in a developed country context will work in the same way in developing countries.

We can also use this opportunity to draw some conclusions about organisations. Our case studies and our model remind us that organisations are not formal and rational entities. So they are not best understood solely through descriptions of formal strategies and formal structures and formal processes. Instead, in seeking to understand the organisation and the role of information systems within it, we must also view the organisation as a human, subjective, political entity. For example, we must disaggregate the organisation to see the different stakeholders within it and those outside it; and we must identify the roles and interests of different stakeholders vis-à-vis any particular information system. This immediately suggests that there is a problem with many of the technically rational textbook recommendations for the successful introduction of information systems. These tend to focus on adopting what, in an ideal world, would be logically the best technical solution. Such recommendations are clearly inadequate since they take no account of wider information systems, and organisational and environmental factors.

The implications for this model indicate that it is necessary to consider all the factors within the five rings when analysing an information system, and explore their relationships, in other words to be systemic. Because there are many factors (not all of which are listed in the five rings), it could help us for now to try and group them. Heeks uses a grouping based on the acronym ITPOSMO. We will use a grouping based on the acronym ITPPOE – set out in Table 1.1 below.

Table 1.1 ITPPOE

| I - Information factors | • Data  
| • Information  
| • Knowledge  |
| T - Technology factors | • Hardware  
| • Software  
| • Telecommunications  
| • Input, processing, storage, output, communication  |
| P - Processes | • Achieving the information system’s objectives  |
| P - People factors | • Objectives and motivations  
| • Skills  
| • Management  
| • Leadership  |
| O - Organisational factors | • Strategy  
| • Structure  
| • Culture  
| • Politics  |
| E - Environmental factors | • Political  
| • Economic  
| • Socio-cultural  
| • Technical  
| • Institutional  |
The ITPPOE acronym is slightly closer to the structure of the five rings although it contains some factors not in the diagram. ITPOSOM and ITPPOE are more or less equivalent, and you can choose to use whichever you prefer, or you can develop a grouping of your own. We would be eager to hear from you if you can identify a grouping with a more memorable acronym!

1.8 Information Systems and the Organisational Rationality–Reality Gap

We turn now to the question that has dominated this unit, and indeed dominates the course:

- Why do so many information systems fail?

Look now at the way Heeks introduces this question.

Reading

Please read pages 7–11 of Heeks’s textbook (starting from section 1.2).

Please take careful note of the following key concepts:

- The three different approaches to e-government management: the organisational rationality (hard); personal politics (soft) and hybrid approaches.
- The gap between rationality by design (what an organisation should be), and reality (what an organisation is).

You will find this exercise a worthwhile use of your time. We will be using these concepts intensively throughout the remaining units, and will assume that you have understood them fully from this section.

We see from Heeks’s discussion that one very plausible explanation of why information systems fail in an organisation is because of the gap between a system’s formally stated objectives, which are rational or rhetorical, and the reality of life and work within that organisation. The larger the gap between the two, the less likely the system is to succeed.

Understanding this gap will provide you with a powerful tool for understanding information systems, as you recognise that a major source of IS failure arises from the rooting of many computerised information systems in a framework of organisational rationality.

Heeks explains this gap in terms of two different management approaches. Both approaches have an innate sense of rationality. That is to say, they explain a set of underlying objectives, which organisational actors could rationally use in order to guide their behaviour.

- The organisational rationality approach: such models emphasise the formal, the quantitative and the technical aspects of organisations. They are often prescriptive, stating how the organisations should be.
- The personal politics approach: this states that decisions and actions are made in order to produce outcomes that best meet covert personal
objectives – that are not necessarily malign, and could often be well-intended. This model emphasises the informal, the qualitative and the human aspects of organisations. Such models are often descriptive, stating how the organisations are.

The concept of organisational rationality is clearly a very important one. Many organisations strive for it, and many managers feel they ought to be following it. However, there are so many gaps between it and the actual functioning of organisational systems that we cannot accept that it addresses the majority of real world situations. Anyone who has worked in a large organisation has probably observed and experienced the dissonance between what is claimed in the organisation’s mission and vision statements and marketing brochures, and what actually happens inside. The utility of organisational rationality lies in guiding structured decisions, and in helping us understand the norms against which organisations often judge themselves. It is thus often invoked by managers when they are asked to explain their actions.

It is important to note that we are not arguing that personal politics (or political rationality as it is alternatively called) explains everything that is going on in public sector organisations. This is clearly not so. As Heeks mentions on page 10, some PSOs, for example, may operate both in theory and practice according to organisationally rational guidelines, which would require at certain times to focus on the technological aspects of projects. Nor are we arguing that situations described by political rationality entail a rejection of all formal models, otherwise we run the risk of not implementing a system at all. A balance is required.

Most self-interested decisions still require formal information to be gathered and logical choices to be made. Let us take the extreme example of a corrupt manager who will decide a contract on the basis of ‘kickbacks’. That manager still makes decisions, still needs information (e.g. on which vendor will provide the biggest kickback, on the dangers of being caught, on strategies for reducing the chances of detection), and still needs that information to be accurate, reliable, timely, etc.!

So if the notion of personal politics is better at explaining what really goes on in public sector organisations, what does it look like? In an earlier textbook, Heeks (2001, p.64) lists these six attributes of personal politics in PSOs:

1. Formal organisational objectives often relate to the objectives of a group (the public), which is not directly represented within the organisation.
2. Loyalties may be greater to one’s professional peer group than to one’s organisation.
3. There is a greater number of internal and external stakeholders, creating greater conflicts of interest.
4. Political conflict and compromise over resource allocation have come to be seen as activities inherent to the public sector and its power culture.
5. Job insecurities may be fewer.
6. Personal performance measurement and a sense of value added are often poorly developed.
Reading

Please read the article by Peled in your Course Reader: ‘First-class technology – third-rate bureaucracy: the case of Israel’.

As you read this lively paper, note down examples from it that correspond to Heeks’s six attributes of personal politics in public sector organisations.

There are a number of examples in Peled’s paper that equate to Heeks’s list – these include the following.

1. Peled’s conclusion is that ‘the taxpayer pays more but gets the same bureaucratic gridlock and poor client service’ (p56).
2. From page 52: despite this long list of computing failures, Israeli PMIS directors are proud of their achievements and claim to be different from other managers in the public sector.
3. The ‘Gulgalo System’ described on pages 54–55.
4. The conflict, described throughout the paper, between the Ministry of Finance and the other Ministries over information system development.
5. More than half of the Israeli PMIS directors have served in their ministries for over 25 years, and about a third of them have been working in the public sector for over 30 years (p52).
6. The desire of PMIS directors to build their own ‘information empire’ (p57).

Peled’s paper is an eloquent, but not untypical, example of how, in the public sector, a strongly emphasised facade of organisational rationality often covers a seething mass of very different personal politics and political rationalities. Often, information systems managers fail to go beneath the surface and constructively engage with the complexities of the situation; this is partly because of a focus on technical aspects and a lack of understanding of the context in which information systems operate.

In your next reading, Heeks uses Peled’s paper to elaborate on the importance of politics, power and influence in e-government in more detail and in a more structured fashion.

Reading

Please read Section 5.5 (pp.120–25) of Heeks’s textbook. Make sure you study Box 5.8, which contains his description of Peled’s paper.

As you read these pages, note the different types of power and influence that Heeks lists. What strategies does Heeks suggest to increase power and influence?

Our discussion on information systems and the organisational rationality–reality gap quite reasonably leads onto the final, and important question:

- How can we use our knowledge of these two management approaches to increase the chances of success of new information systems and technology?

There are two extreme positions on a continuum of management approaches for the use of information systems and technology shown in Figure 1.3.
Each of these extremes is described in turn.

1 Using information systems and technology to support organisational rationality

In this approach, the system (or technology) is intended to assist or create formal organisational change. It may thus be used to:

- provide information for formal decision making that would speed up decisions or reduce their uncertainty, or
- overcome or eliminate human limitations and subjective elements in decision making.

Thus, this approach holds a ‘blueprint’ of what it sees as best organisational form, and it tries to use information systems and technology to create – or even impose – that form.

Information systems developed from this extreme incorporate a significant set of rational structures, processes and even rational assumptions about the culture and strategies of the organisation.

For example, if staff are seen using their personal judgement in decisions, the response might be to introduce an automated decision support system (DSS) to remove the subjective elements and have more organisationally effective decision making.

However, this approach may encounter substantial difficulties in the many public sector organisations whose operations diverge from organisational rationality and are based on political rationality or some other perspective, such as professional judgement. In such situations, introducing computer-based information systems is likely to prove very difficult because it is trying to impose order on structures and processes that are often politically motivated and can be disorderly or irrational. The amount of change required to introduce and operate these information systems will therefore be great. The greater the amount of change required, the more constraints there will be, the more problems there will be, and the greater the likelihood of information systems failure.

Therefore rationality supporting (or imposing) information systems are more likely to fail. Unfortunately, most systems are introduced or updated for ‘rational’ reasons.

2 Using information systems and technology to support organisational reality

In this approach, the system (or technology) is intended to assist existing activities within the organisation. It may thus be used to:

- provide information of political value in decisions
• provide a rich variety of information – for instance, about new solutions
• support informal processes and personal agendas
• cope flexibly with different decision/communication types, individual styles and contexts
• act as a symbol that legitimises the process of management and the work of managers by reinforcing the idea that managers have some effect on their organisation’s performance.

The applicability of information systems is potentially more limited within this approach, since many of the informal, subjective, political processes of the organisation are not amenable to automation, and therefore even if successful, any such system is likely to bring only limited organisational benefits. However, this approach is likely to run into far fewer difficulties because it will normally require less change than the first approach. The likelihood of success is therefore greater.

Applications designed to support organisational reality are often information and communication technologies more than information systems; a vivid example of that is the spread of electronic mail systems (email), spreadsheets and word processors in almost every organisation you can think of. These technologies (also called desktop applications) require fewer rationalities as pre-conditions, and can work successfully in a wide variety of organisational environments, including those that are not organisationally rational.

Let us deepen this into one of these types of application/technology: word processing. This makes some presumptions about skills and technical infrastructure, and about cultural values related to technology and to documentation. However, these presumptions are far fewer than for the decision support system, and it can be assumed that it supports ‘rational’ (structured, as will be clarified in Unit 3) decisions. Word processing may therefore lead to limited organisational benefits, but will succeed in far more situations than the introduction of more complex decision support systems.

To summarise, therefore, the organisationally rational approach has a potentially high organisational benefit but a high risk of failure. In contrast, supporting organisational reality has a low organisational benefit but a higher risk of success. Heeks’s hybrid management approach seeks to place information systems somewhere in the middle of the continuum.

As a final message for you as an information systems manager or user, it is important to understand organisational dynamics and what appears to be a dominant mentality (organisational reality or personal politics based), so as to select appropriate approaches (or combination of them) to facilitate the planning, design, development and use of information systems. With a hybrid approach, there might be better chances of promoting continuous learning throughout your organisation and its individuals, giving people (including yourself) better chances to produce better systems in the long run.
1.9 Summary

This unit has introduced some of the basic definitions and concepts that we will use throughout the rest of the course. In it, we have distinguished between data information and knowledge, and looked at the importance of information in public sector organisations and how, despite this importance, the failure of information systems to meet their objectives is widespread. We have also noted that information systems are much more complex than just a mechanism to input, process, store, output and communicate information, and therefore that we need to look at several technical and non-technical aspects together in a systemic perspective. In line with this, we have acknowledged that we cannot separate the mechanism of the information system from its contextual factors and, in particular, from people, organisational and environmental factors. Hence we introduced the ‘onion ring’ contextual model of information systems.

The unit has two main conclusions. Our first conclusion is, that in many (though not all) public sector organisations, the perspective of political rationality (personal politics) fits better than the perspective of organisational rationality.

Secondly, in many (though not all) public sector organisations, there is likely to be a significant gap between the prescriptions of organisational rationality and organisational reality, which is driven by the politically rational behaviour of those within the organisation. The unit argues that this gap is the main reason behind the many failures of information systems in public sector organisations despite the inherent usefulness of information systems and technology. This notion – that there is a significant gap between rationality and reality that needs addressing through our thinking and approaches in information systems– will be a continuing theme throughout the course.

Review Questions

To help you review the material covered in this unit, you might want to write a few notes to answer the following questions:

- What is data, information and knowledge?
- What is an information system?
- What is systems thinking?
- What is the difference between the process model and the contextual model of information systems?
- List as many reasons as possible behind information system failure in public sector organisations.
- What are the main elements that you will find in most case studies?
- What are the factors within the ITPPOE grouping?
- What are some of the characteristics of behaviour motivated by personal politics?
- Can you think of information systems and technologies (other than decision support systems) that support organisational rationality?
- Can you think of information systems and technologies (other than word processing) that support organisational reality?
References and Websites


