

E-Commerce

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Lecture 9

MGM 212
Analysis and design.



جامعة الجميع الذكية
EVERYONE'S SMART UNIVERSITY

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Course Outline

Lecture 1: Introduction to e-business and e-commerce.

Lecture 2: E-commerce fundamentals.

Lecture 3: E-business infrastructure.

Lecture 4: - E-environment.

Lecture 5: E-business strategy

Lecture 6: E-procurement.

Lecture 7: E-marketing.

Lecture 8: Customer relationship management.

Lecture 9: Analysis and design.

Lecture 10: Implementation and maintenance.

- 1. Introduction.**
- 2. Analysis for e-business.**
- 3. Process modelling.**
- 4. Data modelling.**
- 5. Design for e-business.**
- 6. User-centred site design.**
- 7. Security design for e-business.**

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Learning Outcomes

After completing this chapter the student should be able to:

1. Summarize approaches for analyzing requirements for e-business systems
2. Identify key elements of approaches to improve the interface design and security design of e-commerce systems.

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1. Introduction:

The chapter is intended to provide managers with an appreciation of some analysis and design techniques for e-business, to provide familiarity with techniques such as process analysis, data modelling and use-case design. This familiarity should aid collaboration when the managers are involved in discussing the requirements of the system with technical staff. It is in two main parts. **In the first part** we review analysis techniques and in particular process analysis for re-engineering which is important in many e-business implementations. We also touch on data modelling. Data modelling is not described in detail since this is a very well established technique.

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The second part looks at the design of e-business systems. The techniques described are aimed at improving the information quality of end-users of e-business systems – ensuring information is timely and secure, has the correct content in terms of accuracy, relevance and completeness, and is in a form that is easy to interpret. The section on architectural design looks at how systems are integrated to improve flow of information and also to achieve timely delivery of information.

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2. Analysis for e-business:

Analysis for e-business is concerned with understanding the business and user requirements for a new system. Typical analysis activity can be broken down into: understanding the current process and then reviewing possible alternatives for implementing the e-business solution. In the following sections we will review different techniques that enable us to summarize the operation of current processes and proposed e-business processes. In this section we focus on using diagrams to demonstrate the business processes. User requirements capture techniques that help determine the function required by a system are described in the Focus on user-centred site design section.

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Analysts recognize that delivering quality information to employees and partners, or exchanging it between processes, is the key to building information systems that improve efficiency and customer service. **Pant and Ravichandran** say:

Information is an agent of coordination and control and serves as a glue that holds together organizations, franchises, supply chains and distribution channels. Along with material and other resource flows, information flows must also be handled effectively in any organization.

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- Workflow management

Analyzing and revising an organization's workflow as part of workflow management (WFM) is a concept that is integral to many e-business applications, so before we look at process analysis techniques, let us look at why workflow is integral to e-business. **WFM was defined by the Workflow Management Coalition (WfMC)** as the automation of a business process, in whole or part during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules.

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3. Process modelling:

Traditional approaches to process analysis use established systems analysis and design methods that are part of methodologies such as Structured Systems Analysis and Design Methodology (SSADM), like the data flow diagram technique . **Such approaches often use a hierarchical method of establishing**

- the processes and their constituent sub-processes
- the dependencies between processes
- the inputs (resources) needed by the processes and the outputs.

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- Process mapping

Existing business processes often overlap between different functional areas of a business. So, before detailed activities are identified the analyst needs to identify where in the organization processes occur and who is responsible for them. This procedure is often known as 'process mapping'.

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- Task analysis and task decomposition

Before a process such as 'prepare proposal' can be designed and implemented, a more detailed breakdown is required. This is usually referred to as 'task analysis'.

- Process dependencies

Process dependencies summarize the order in which activities occur according to the business rules that govern the processes. Normally, activities occur in a sequence and are serial; sometimes activities can occur simultaneously, when they are known as parallel.

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- Validating a new process model

Whichever method has been used to arrive at the process definition, we need to check that the process definition is realistic. When developing a wish list of process capabilities and corresponding business rules the stages described by David Taylor in his book on concurrent engineering may be useful.

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4. Data modelling:

Data modelling of e-business and e-commerce systems uses well established techniques such as normalization that are used for relational database analysis and design. As a consequence, this section is brief in comparison with that on process modelling which introduces some novel techniques.

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The approach we use to explore data modelling for e-commerce is to use examples that identify typical elements of data modelling for a sell-side e-commerce system. We will use ER (entity relationship) modelling to review typical structures for these databases. **In simple ER modelling there are three main stages:**

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1. Identify entities

Entities define the broad groupings of information such as information about different people, transactions or products. Examples include customer, employee, sales orders, purchase orders. When the design is implemented each design will form a database table.

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2. Identify attributes for entities

Entities have different properties known as 'attributes' that describe the characteristics of any single instance of an entity. For example, the customer entity has attributes such as name, phone number and e-mail address. When the design is implemented each attribute will form a field, and the collection of fields for one instance of the entity such as a particular customer will form a **record**.

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3. Identify relationships between entities

The relationships between entities require identification of which fields are used to link the tables. For example, for each order a customer places we need to know which customer has placed the order and which product they have ordered.

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5. Design for e-business:

The design element of creating an e-business system involves specifying how the system should be structured.

In the two Focus on sections that follow we look at two aspects of design that are of great importance to how e-business systems are perceived by customers – security and interface design. Before that, we consider the overall architectural design of e-business systems.

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- Architectural design of e-business systems

The starting point for design of e-business systems is to ensure that a common architecture exists across the company in terms of hardware and software technology, applications and business processes.

E-business systems follow the same client–server model architecture of many business information systems created in the 1990s. For the e-business, the clients are typically employees, suppliers or customers' desktop PCs which give the 'front-end' access point to e-business applications. The clients are connected to a 'back-end' server computer via an intranet, extranet or Internet.

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6. User-centred site design:

Since e-business systems are often customer- or employee-facing systems, the importance of human–computer interaction is high in the design of web applications. Referring to web-site design, **Nigel Bevan** says:

Unless a web site meets the needs of the intended users it will not meet the needs of the organization providing the web site. Web site development should be user-centred, evaluating the evolving design against user requirements.

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Noyes and Baber explain that user-centred design involves more than user interface design. It can be conceived of as centering on the human, but surrounded concentrically by factors that affect usability such as user interface, computers, workplace and the environment.

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- Use-case analysis

The use-case method of process analysis and modelling was developed in the early 1990s as part of the development of object-oriented techniques. It is part of a methodology known as 'Unified Modelling Language' (UML) that attempts to unify the approaches that preceded it such as the Booch, OMT and Objector notations. **Jacobsen et al.**, give an accessible introduction and describe how object modelling can be applied to workflow analysis.

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- Persona and scenario analysis

Web-site designers and marketers use a similar model to the use-case for web-site design favored by system analysts and designers, but using different terminology. Marketers create web design personas for typical site visitors; this is a powerful technique for influencing the planning of online campaigns and the usability and customer-centricity of a web site.

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Customer scenarios are developed for different personas. Patricia Seybold in the book The Customer Revolution **Seybold and Marshak**, explains them as follows:

A customer scenario is a set of tasks that a particular customer wants or needs to do in order to accomplish his or her desired outcome.

You will see that scenarios can be developed for each persona. For an online bank, scenarios might include:

1. **New customer** – opening an online account.
2. **Existing customer** – transferring an account online.
3. **Existing customer** – finding an additional product.

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Each scenario is split up into a series of steps or tasks before the scenario is completed. These steps can be best thought of as a series of questions a visitor asks. By identifying questions web-site designers identify the different information needs of different customer types at different stages in the buying process.

The use of scenarios is a simple, but very powerful web design technique that is still relatively rare in web-site design. They can also be used when benchmarking competitor sites as part of situation analysis.

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The customer persona/scenario approach has the benefits of:

- Fostering customer-centricity.
- Identifies detailed information needs and steps required by customers.
- Can be used to both test existing web-site designs or prototypes and to devise new designs.
- Can be used to compare and test the strength and clarity of communication of proposition on different web sites.
- Can be linked to specific marketing outcomes required by site owners.

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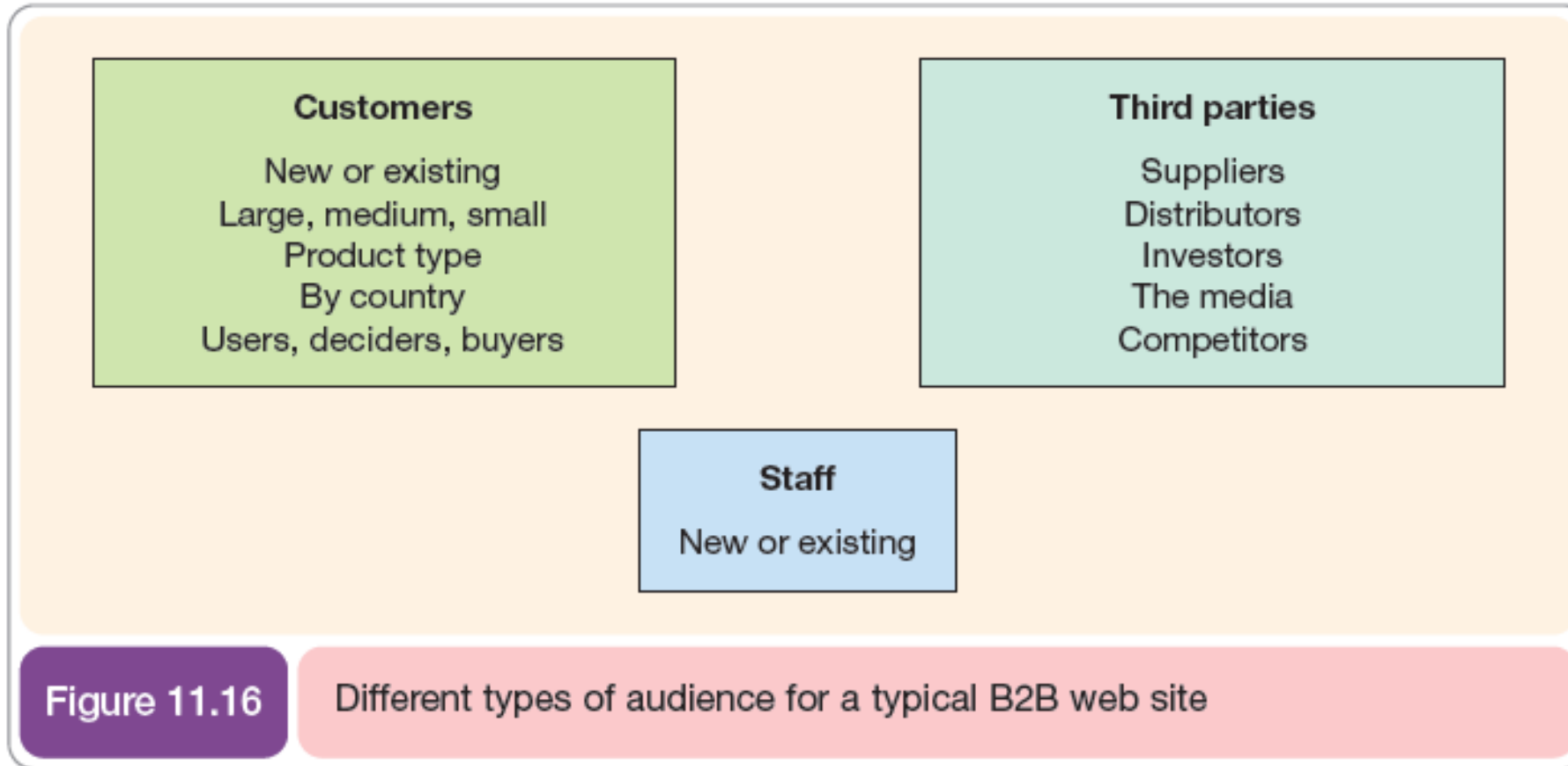
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- Customer orientation

A well designed site will have been developed to achieve customer orientation or customer centricity. This involves the difficult task of trying to provide content and services to appeal to a wide range of audiences. For a B2B company the three main types of audience are customers, other companies and organizations, and staff. The detailed breakdown of these audiences is illustrated in Figure 11.16.

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As well as customer segments, designers also need to take into account variations in the backgrounds of visitors to the site. **These can be thought of as four different types of familiarity:**

- 1. Familiarity with the Internet** – are short cuts provided for those familiar with the Internet? And for novices is there help to lead them through your site?

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- 2. Familiarity with organization** – for customers who do not know the organization, content is needed to explain who the company is and demonstrate credibility through ‘About Us’ options and customer testimonials.
- 3. Familiarity with organization’s products** – even existing customers may not know the full range of your product offering.
- 4. Familiarity with your site** – site maps, search and help options are not just ‘nice to have’ options for an e-commerce site, because you may lose potential customers if they cannot be helped when they are lost.

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- Elements of site design

Once the requirements of the user are established we can turn our attention to the design of the human–computer interface. **Nielsen** structures his book on web usability according to three main areas, which can be interpreted as follows:

1. **Site design and structure** – the overall structure of the site.
2. **Page design** – the layout of individual pages.
3. **Content design** – how the text and graphic content on each page is designed.

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- Web accessibility

Web accessibility is another core requirement for web sites. It is about allowing all users of a web site to interact with it regardless of disabilities they may have or the web browser or platform they are using to access the site. The visually impaired are the main audience that designing an accessible web site can help. However, increased usage of mobile or wireless access devices such as personal digital assistants (PDAs) and GPRS or 3G phones also make consideration of accessibility important.

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7. Security design for e-business:

Security is a prime concern of e-business managers. The principal concern is the security of information: both about customers and internal company data about finance, logistics, marketing and employees. These risks apply to all companies, large and small. Larger companies tend to be more at risk from targeted attacks which are directed at disrupting services. Information used within e-business systems must be safeguarded from a range of hazards.

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- Managing computer viruses

Computer viruses are a significant threat to company and personal information since it is estimated that there are now over 100,000 of them.

- Types of virus

1. Boot-sector virus. Boot-sector viruses were most important when floppy disks were widely used.

2. Worms. A worm is a small computer program that replicates itself and then transfers itself from one machine to the next.

3. Macro-viruses. Macro-viruses are piggybacked on documents created by office applications such as Microsoft Word and Excel.

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4. **E-mail attachment viruses.** These viruses are activated when a user of an e-mail program opens an attachment.
5. **Trojan viruses.** A Trojan is a virus that masquerades as a bona fide application.
6. **Hoax e-mail viruses.** These are warnings about viruses which are not real viruses which ask the recipient to send the warning on to their friends.

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- **Monitoring of electronic communications**

Employee communications monitoring or surveillance is used by organizations to reduce productivity losses through time wasting. Time can be wasted when a member of staff spends time when they are paid to work checking personal e-mail messages or accessing the Internet for personal interests.

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- E-mail management

E-mail is now an essential business communication tool and is also widely used for personal use. The popularity of e-mail as a communication tool has resulted in billions of messages being sent each day. For the individual, managing these communications in their e-mail inbox is rapidly becoming impossible! For the information services manager and indeed any business manager, there are three main controls that need to be considered to reduce the amount of time effectively wasted by staff reading e-mail. **Controls can be introduced as part of an e-mail management policy to minimize the volume of:**

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1. Spam (unsolicited e-mail).
2. Internal business e-mail.
3. External business e-mail.
4. Personal e-mail (friends and family).

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Chapter 11

