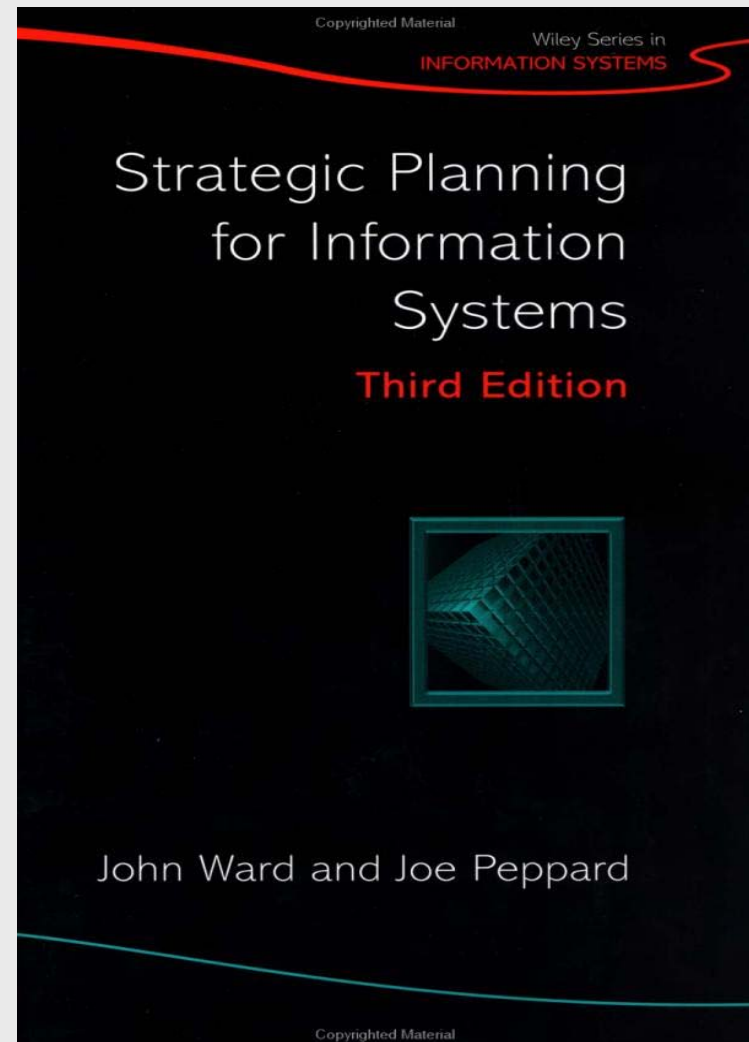


Application of Computer in Railway

Dr. Masoud Yaghini

Textbook

J. Ward and J. Peppard,
**Strategic
Planning for
Information
Systems,**
Third Edition, John
Willey, 2002.



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1

The Evolving Role of Information Systems and Technology in Organizations: A Strategic Perspective

Information Systems (IS) and Information Technology (IT)

Fundamental Terminology

- ◆ Information Technology
- ◆ Information Systems
- ◆ Application
- ◆ E-Business
- ◆ E-Commerce

What is Information Technology?

- ◆ IT refers to technologies, essentially:
 - Hardware
 - Software
 - Telecommunications networks
- ◆ IT facilitate the acquisition, processing, storing, delivery, and sharing information

What is Information Technology?

(Cont.)

- ◆ In the European Union, the term Information and Communication Technologies or ICT is generally used instead of IT

What is an Information System?

- ◆ IS Definition: the means by which people and organizations, utilizing technology, gather, process, store, use and disseminates information
- ◆ It is concerned with the purposeful utilization of information technology.

What is an Application?

- ◆ An Application refers to the use of IT to address a business activity or process.
- ◆ **Types of application:**
 - Uses of IT to carry out general tasks. e.g. Word processing, E-mail, Presentation
 - Uses of IT to perform specific business activities or processes, e.g. Accounting, Production scheduling, Order processing

What is an Application? (Cont.)

- ◆ Applications can be carried out using:
 - Pre-written, pre-packaged software programs
 - Software programs be developed to provide particular functionality

E-Business and E-Commerce

- ◆ **E-Commerce** refers to the conduct of commerce electronically – essentially using Internet technologies.
- ◆ **E-Business** refers to the automation of an organization's internal business processes.

Early Views and Models of IS/IT in Organizations

Early Views and Models of IS/IT in Organizations

- ◆ In the early 1950s, the use of computers in business began

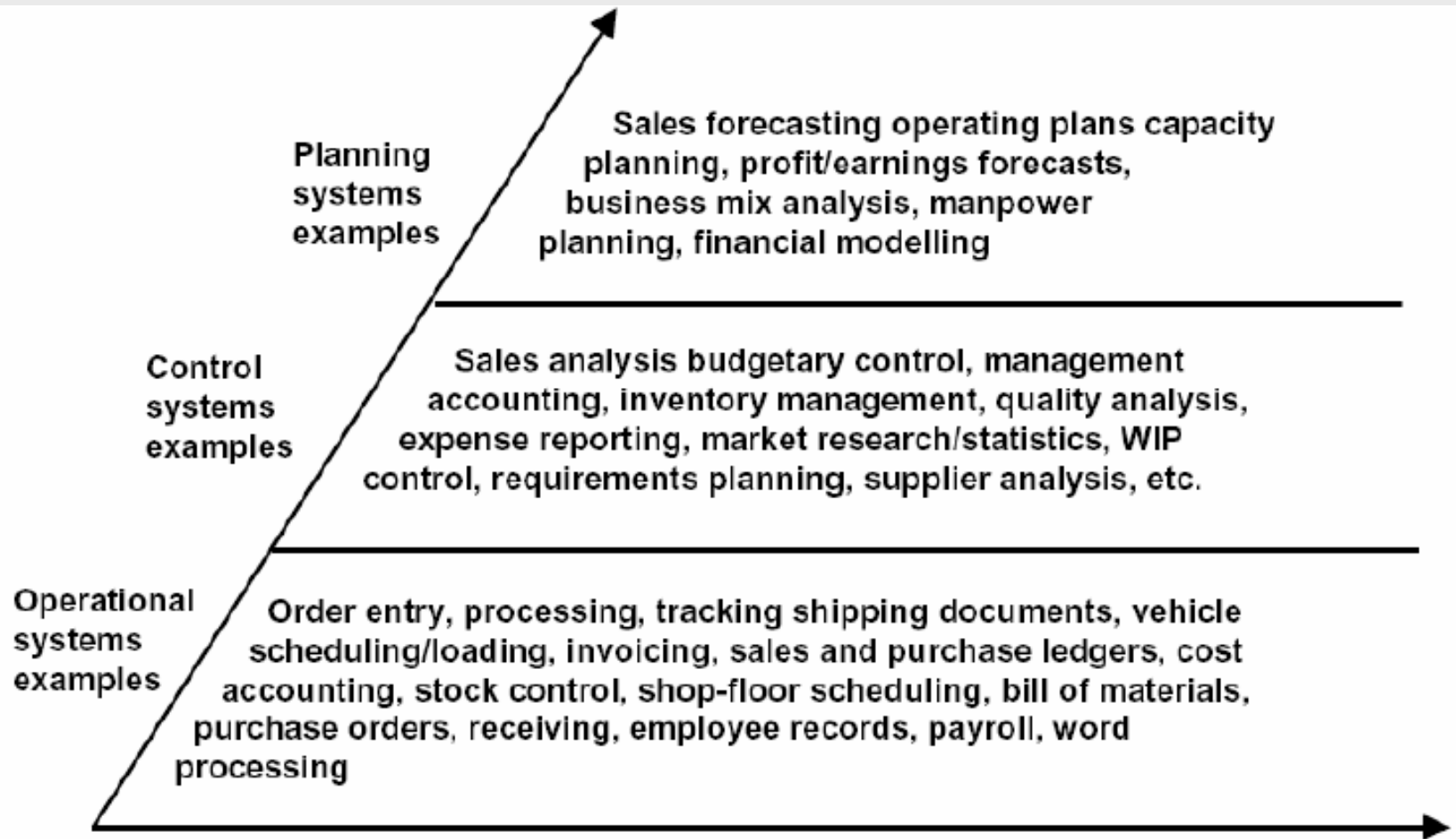
Date Processing (DP) Era

- ◆ In the mid- to late 1960s, the use of computers became significant with the development of multi-purpose mainframe computers
- ◆ Major increases in processing speed, cheaper memory, improved storage capacity, better programming languages

DP Era (Cont.)

- ◆ Operational information systems (*Data Processing Systems*) were well developed
- ◆ Operational information systems mainly were used for transaction handling and control,

Typical Planning, Control And Operational Systems (Anthony 1965)



Early Views and Models: Up to 1980

Management Information Systems (MIS) Era

- ◆ During 1970s, minicomputers of increasing power were used for a variety of business applications
- ◆ The management information systems (MIS) developed for control and planning
- ◆ These systems provide information to managers.

The DP and MIS Eras: The Lessons Learned

DP Era lessons

- ◆ Need to **understand the process of developing complete information systems**, not just the programs to process data.
- ◆ More thorough **requirements and data analysis** to improve systems linkages and a more engineered approach to designing systems components
- ◆ More appropriate justification of investments by assessing the economics of efficiency gains and converting these to **return on investment**
- ◆ Less creative, more **structured approaches** to programming, testing and documentation to reduce the problems of future amendments
- ◆ Extended project management which recognized the need for **coordination of both user and DP functions** and the particular need to establish user management in a decisive role in the systems development – the user had to live with the consequences
- ◆ The need for **planning the interrelated set of systems** required by the organizations

MIS Era lessons

- ◆ **Justification of IS investments** is not entirely a matter of return on investment / financial analysis
- ◆ Databases require large restructuring projects and **heavy user involvement** in data definition
- ◆ The IS resource needs to a **service orientation** to enable users to obtain their own information from the data resource
- ◆ Need for **organizational policies**, not just DP methodologies
- ◆ **Personal computers** enable better MIS to be developed, provided that users and IS people both focus on the information needs rather than the technology

The Three-Era Model

The Three-Era Model

- ◆ Data Processing Era
 - To improve operational **efficiency** by automating information-based processes
- ◆ Management Information Systems Era
 - To increase management **effectiveness** by satisfying their information requirements for decision making
- ◆ Strategic Information Systems Era
 - To improve **competitiveness** by changing the nature or conduct of business –IS/IT as a source of competitive advantage

Relationship Between Three Eras

- ◆ Just as good MIS systems rely on good operational DP systems for accurate, timely information, SIS rely on DP and MIS systems
- ◆ SIS's functions are often the same as for DP and MIS application, they impact on the business due to the changes they enable or cause that is different
- ◆ The DP and MIS systems may need to be redeveloped SIS systems because they inhibit the benefits to be gained from the SIS

The Strategic Information Systems Era

Strategic Information Systems (SIS) Era

- ◆ During the late 1970s, a number of organizations had begun to use IS/IT in ways that fundamentally changed how their business was conducted.
- ◆ The use of IS/IT was directly influencing their competitive position.
- ◆ Implying a new relationship between IS/IT investment and strategic development.

Classification of Strategic Systems

Types of strategic system:

- ◆ Linking to customers and Suppliers
- ◆ Improved Integration of Internal Processes
- ◆ Information-bases Products and Services
- ◆ Executive Information Systems

Linking to customers and Suppliers

- ◆ Share information via technology-based systems with customers and suppliers and change the nature of the relationship
- ◆ Sales/marketing, and distribution management at the customer end, or purchasing/receiving management involved in these system
- ◆ Example: American Hospital Supply developed an order entry distribution system

Improved Integration of Internal Processes

- ◆ Produce more effective integration of the use of information in the organization's value-adding processes
- ◆ Customer Relationship Management (CRM) systems integrate customer information
- ◆ Enterprise Resource Planning (ERP) integrate information within and cross functional areas in an organization

Information-based Products and Services

- ◆ Enable the organization to develop, produce, market and deliver new or enhanced products or services based on information
- ◆ Example: Merrill Lynch Cash Management Account that combines cheque, credit, saving and facilities.
- ◆ On-line banking has a similar logic

Executive Information Systems

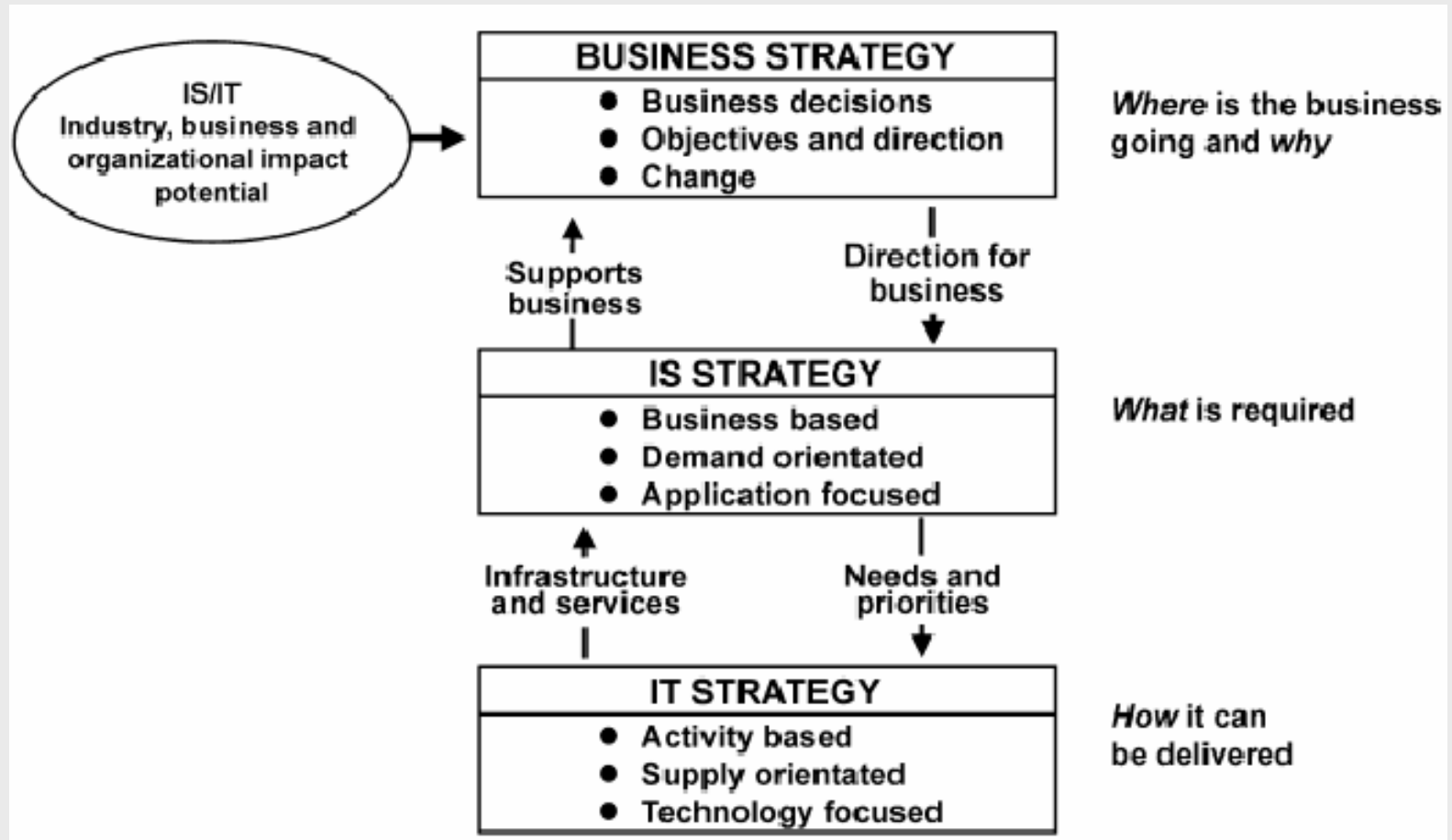
- ◆ Provide executive management with information to support the development and implementation of strategy
- ◆ In particular, where relevant external and internal information are integrated in analysis
- ◆ To date, this type of application provides the smallest number of examples

Three Era Model

Era	Objectives of using IS/IT	When?
Data Processing (DP)	To improve operational efficiency by automating information-based processes	<i>1960's</i> →
Management Information Systems (MIS)	To increase management effectiveness by satisfying their information requirements for decision making	<i>1970's</i> →
Strategic Information Systems (SIS)	To improve competitiveness by changing the nature or conduct of business –IS/IT as a source of competitive advantage	<i>1980's</i> →

The Management Implications

The Relationship between business, IS, and IT strategies



The Relationship between business, IS, and IT strategies (Cont.)

- ◆ IS/IT impact and potential >
- ◆ ***Business strategy*** > direction for business >
- ◆ ***IS strategy*** > needs and priorities >
- ◆ ***IT strategy*** > infrastructure and services >
- ◆ ***IS strategy*** > supports business >
- ◆ ***Business strategy***

Application Portfolio

Strategic Applications which <i>are critical to</i> sustaining future business strategy	High Potential Applications which <i>may be of important</i> in achieving future success
Applications on which the organization <i>currently depends</i> for success Key Operational	Applications which are <i>valuable but not critical</i> for success Support

What is and IS/IT Strategy?

What is an IS/IT Strategy?

- ◆ Essentially, an IS/IT strategy is composed of two parts:
 - an IS component
 - an IT component

What is an IS/IT Strategy? (Cont.)

◆ The IS strategy

- Defines the organization's requirement for information and systems to support the overall strategy of the business
- It is taking into consideration both the competitive impact and alignment requirements of IS/IT
- It defines and prioritizes the investments required to achieve the ideal applications
- *IS Demand* refers to IS Strategy

What is an IS/IT Strategy? (Cont.)

◆ The IT strategy

- Outline the vision of how the organization's demand for information and systems will be supported by technology
- It addresses the provision of IT capabilities and resources (including hardware, software and telecommunications)
- *IT supply* refers to IT Strategy.

Strategic Alignment

- ◆ A number models were developed to assess the extent of alignment of business strategies and IS/IT strategies.

Why Have an IS/IT Strategy?

Or: Consequences of not having an IS/IT Strategy

- ◆ Systems investments are made that do not support business objectives
- ◆ Loss of control of IS/IT
- ◆ Systems are not integrated
- ◆ No means of setting priorities for IS projects
- ◆ No mechanisms for deciding optimum resource allocation
- ◆ Misunderstanding between users and IT specialists
- ◆ Inadequate infrastructure investments made

Why Have an IS/IT Strategy?

Or: Consequences of not having an IS/IT Strategy (Cont.)

- ◆ Technology strategy is incoherent
- ◆ All projects evaluated on financial basis only.
- ◆ Problems caused by IS/IT investments can become a source of conflict between parts of the organization.
- ◆ Localized justification of investments can produce benefits that are actually counterproductive in the overall business context.
- ◆ Systems, on average, have a shorter than expected business life and require

Toward A Fourth Era: An Organization IS Capability

Toward A Fourth Era

- ◆ Few organizations continuously achieve advantage from their IS/IT investments
- ◆ Although organizations may gain some ‘first mover advantage’ with an innovative application, it can be quickly copied
- ◆ In the fourth era, organizations seek IS capability,
- ◆ Enabling an organization continuously to derive value through IS/IT.
- ◆ IT/IS inseparable from enterprise

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Chapter 1: The Role of IT in Organizations

The End