Business Information Systems I

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Abstract

This course offers a methodology to align IT design decisions with business goals. It introduces the concept of IT architecture, classifies key IT design choices, and examines how these choices impact IT architecture from both a software and infrastructure perspective. The course explores IT architecture within the manufacturing, utilities, and financial services sectors, focusing on both internal and external organizational processes along the industry value chain (e-business). It also equips students with the tools to analyze organizational requirements, with a particular emphasis on executive information systems, including the use of Key Performance Indicators.

Building on the concept of IT architecture, the course outlines a functional map of Enterprise Resource Planning systems, distinguishing between core and extended functionalities. It traces the evolution of information systems over time and highlights how ERPs have emerged through an ongoing process of functional integration. The course begins with a review of organizational theory from an information perspective, providing a framework to understand the organizational changes driven by ERP implementations. It then delves into the core functional areas of ERP systems, such as accounting and finance, operations, and management and control. The course will feature lectures and case study discussions to reinforce these concepts.

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CHAPTER 1

Introduction

1.1 Technology

Definition (*Technology*)**.** A technology represents a process that a given organization can perform, together with all the resources needed to perform the process.

Definition (*Techincal system*)**.** A technical system represents a set of machines supporting a given technology.

Definition (*Information system*)**.** An information system is a set of coordinated processes producing an information output and executing information processing activities.

Definition (*Information technology architecture*)**.** An information system is a technology, an IT architecture is a techncial system supporting a given information system.

For a long time, there has been an ongoing debate about how technical innovation influences organizations. A well-established set of beliefs links technological advancements to organizational change, shaping how companies adapt and evolve:

1. *Efficiency over effectiveness*: technological innovation primarily enhances efficiency rather than improving overall effectiveness. It streamlines processes but doesn't necessarily guarantee better decision-making or outcomes.

2. *Economies of scale*: as technology advances, businesses can scale operations more efficiently, reducing costs per unit as production increases.

3. *Larger optimal size*: the minimum viable size of an organization tends to grow with technological progress, as larger entities can better leverage new systems.

4. *Increased specialization*: automation and sophisticated systems often lead to a workforce that is more specialized, with employees focusing on narrower, highly technical roles.

5. *Tayloristic perspective*: the traditional view, inspired by Taylorism, assumes that an optimal organizational structure exists.

6. *Limited focus on group work*: early studies largely ignored the impact of technology on teamwork and collaboration, focusing instead on individual efficiency.

7. *Greater bureaucracy and formalization*: as technical systems evolve, so do organizational rules, procedures, and levels of bureaucracy, making work more structured but also more rigid.

8. *More complex management*: with increased technology comes greater managerial complexity, requiring leaders to navigate intricate systems, regulations, and workflows.

1.1.1 Orgnizational theory

Emerging in the 1960s and 1970s, the information processing perspective transformed how organizations viewed technology. As IT became widespread within businesses, it led to a fundamental shift in traditional beliefs about the impact of technical innovation. Key changes included:

- A radical shift in management principles, as technology was no longer just a tool for efficiency but a driver of decision-making and strategy.

- Unlike earlier views, IT wasn't just about automation (it processed information, the most critical resource for managerial processes). Since managerial processes shape decision, it processed information, the most critical resource for managerial processes.

- This shift created both virtuous and vicious cycles: when information systems were well-integrated, they improved decision-making, coordination, and adaptability. However, poor implementation or information overload could lead to inefficiencies, miscommunication, and bureaucratic bottlenecks.