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Introduction to information systems

Upon completing this chapter, you'll have the ability to define an information system by identifying its key components, outline the history of information systems, and summarize the main argument presented in Nicholas Carr's article "Does IT Matter?". The realm of information systems is a rapidly evolving world that seems to change daily. Over the past few decades, these systems have become ubiquitous, often operating behind the scenes in many everyday activities without us even realizing it. Consider how frequently you interact with various components of information systems through electronic devices like smartphones, laptops, and personal computers, which provide constant access to messaging services, banking platforms, online retail stores, and academic resources. At the core of nearly every organization are information systems, offering users a vast array of resources. It's worth pondering why businesses invest in technology; some do so because it's what everyone else is doing, while others conduct thorough research to find the best fit for their needs. As you progress through this book, evaluate each chapter based on how its content could be applied to strengthen your future business endeavors. Making informed decisions can lead to stability and growth. Information systems are integral to daily life, from Wi-fi networks on university campuses to database search services in learning resource centers and printers in computer labs. Even mundane activities like shopping or driving involve interactions with information systems that manage inventory, sales, and traffic flow. Modern vending machines utilize the Internet of Things (IoT) for connectivity, while car computer systems collect data beyond just engine control, such as acceleration, shifting, and braking patterns. Smartphones constantly connect to available networks via Wi-fi, logging location and other data. When thinking about information systems, terms like "computers," "networks," or "databases" might come to mind. The study of information systems encompasses a wide range of devices, software, and data systems. Defining an information system provides a solid foundation for this course. Many business programs require students to study information systems, with various authors offering different definitions. For instance, one definition describes an information system as "a set of interrelated components that collect, process, store, and distribute information". Understanding these definitions is crucial for grasping the concept of information systems. Information systems are tools that organizations use to make decisions, control processes, and analyze data. They consist of hardware, software, telecommunications networks, and people working together to collect, process, store, and disseminate information. The five major components of an information system include technology (hardware, software, and data), people, and processes. Technology refers to the application of scientific knowledge for practical purposes, encompassing hardware, software, and data. Hardware is the physical portion of an information system, while software provides instructions that tell hardware what to do. Data is a collection of facts that can be intangible, like software, or tangible, like hardware. Information Systems: A Comprehensive Overview Information systems are powerful tools that can help businesses make informed decisions by analyzing data. When data is aggregated, indexed, and organized, it becomes a valuable resource for organizations. Data analysis is used to improve performance, and this process involves various components. Effective communication is also crucial in information systems, as it enables the sharing of information between different departments and stakeholders. This component includes both hardware and software aspects. With the rise of hyper-connected devices, networking has become an essential feature of modern information systems. The people involved in information systems are equally important. From support staff to system analysts and developers, everyone plays a vital role in ensuring the smooth functioning of information systems. Understanding the human element is crucial for grasping how information systems integrate into organizations. Processes are another critical component of information systems. Automating activities with technology can improve productivity, but businesses must also focus on enhancing their processes internally and externally to gain a competitive advantage. This involves re-engineering business procedures, managing resources, and integrating technology seamlessly. Ultimately, the role of information systems is to collect, store, organize, and distribute data throughout organizations. By analyzing data and transforming it into information, organizations can make informed decisions that drive success. The evolution of technology has led to the integration of information systems into virtually every aspect of business, making them an indispensable part of modern organizations. From the late 1950s to the 1960s, computers were seen as a means to efficiently process calculations, with early business computers being large room-sized machines that required specialized personnel and facilities. The introduction of time-sharing technology allowed multiple users to access mainframe computers from different locations, enabling various functions such as scientific calculations and accounting. In the late 1960s, Manufacturing Resources Planning (MRP) systems were introduced, giving companies the ability to manage their manufacturing processes more efficiently. This led to a significant increase in businesses adopting computing technologies, with IBM becoming the dominant mainframe company. The advent of personal computers in the mid-1970s revolutionized the industry, with the Altair 8800 being one of the first microcomputers announced to the public. The popularity of these early personal computers grew rapidly, driven by improvements in usability and software availability. Notably, Apple Computer's "Apple II" was a highly successful product that helped popularize personal computing. In response to this emerging market, IBM partnered with Microsoft in 1981 to create an operating system for their own personal computer, the PC. The release of the IBM PC in 1981 marked a significant milestone, providing small businesses with affordable computing solutions and establishing the microcomputer as a legitimate option. The PC's open architecture made it easy for other companies to copy or "clone" it, leading to many new computer companies emerging in the 1980s with cheaper versions of the PC. This drove prices down and encouraged innovation. Microsoft developed Windows, with version 3.1 in 1992 becoming a commercial success. Early PCs were standalone machines, not connected to a network. In the mid-1980s, businesses recognized the need for connectivity, leading to the development of "client-server" networking architecture. This allowed users to log in to a Local Area Network (LAN) from their PC and access resources like printers and files. Software companies developed applications for collaborative work, including electronic mail, which gained popularity during this time. Networking and data sharing primarily occurred within each business, with limited inter-company sharing. Computers were now seen as tools for internal collaboration, replacing mainframe computers at a lower cost. The first Enterprise Resource Planning (ERP) systems emerged on the client-server architecture, representing state-of-the-art integration. The Internet's early days began in 1969 when developers sent the word "login" over a distance of over 350 miles. ARPA Net, an experimental network, eventually became known as the Internet. Initially, it was confined to use by universities, government agencies, and researchers. Users typed commands (command line) for communication and file transfer. The first e-mail messages were sent in the early 1970s as large companies expanded from local networks to the Internet. The computer continued evolving from a purely personal device to a tool for global connectivity. The dawn of digital communications began with Tim Berners-Lee's World Wide Web concept in 1989. This revolutionary idea paved the way for businesses to share info about themselves over the Internet. With web browsers becoming mainstream, companies scrambled to grab domain names and set up websites. The National Science Foundation lifted commercial use restrictions in 1991, triggering a wave of investment in internet-based ventures. eBay and Amazon were founded in 1994, marking the beginning of the dot-com era. However, by 2000, the bubble burst as investors grew tired of losses from hundreds of companies. Yet, this period saw a significant expansion of global connectivity, with thousands of miles of fiber optic cable laid worldwide. The world entered a new era of globalization, which will be discussed in Chapter 11. Meanwhile, connecting Africa to the Internet became a focus area for technological advancements. The digital realm also became increasingly perilous as more companies went online. Computer viruses and worms spread rapidly via the internet, prompting a surge in computer and internet security industries. As businesses adapted to these new threats, they began to incorporate interactive technologies into their websites. The rise of Web 2.0 enabled users to customize their experiences and interact with businesses online. This shift had far-reaching consequences for various industries. Bookstores lost market share as readers turned to e-books and online resources. Video rental chains and travel agencies became obsolete due to digital alternatives. Newspapers saw a significant decline in circulation, making some cities unable to support daily publications. Disintermediation, or the replacement of middlemen by technology, accelerated with Web 2.0's emergence. As users turned to online sources for information and news, physical media experienced a corresponding decline. Given text: paraphrase this text New questions have arisen regarding the role of technology. Should internet access be considered a fundamental right? Can copying a song downloaded from the Internet be legally done? What information can be kept private online? How much personal data is acceptable to collect from children? The rapid pace of technological advancements has left policymakers with insufficient time to establish suitable laws. Ethical concerns surrounding information systems will be addressed in Chapter 12. Ray Ozzie, a Microsoft technology expert, predicted that computing would enter a post-PC era by 2012, but six years later this prediction did not hold true. The market trends reveal a decline in PC sales and tablet sales while smartphone sales have increased due to their mobility and user-friendliness. The PC will still play a vital role in business, though its significance may decrease as people focus on mobility. Cloud computing provides users with access to data and applications from anywhere, reducing the importance of PCs as repositories for programs and information. Advances in technology and communications will continue to propel businesses forward. Walmart's Rise to Prominence: A Story of Information Systems and Competitive Advantage Walmart, the world's largest retailer, has consistently ranked as the number one company for annual revenue since 2018. With over $500 billion in annual sales, Walmart serves more than 260 million customers worldwide through its 11,700 stores in 28 countries. One key factor behind Walmart's success is its emphasis on information systems, particularly in supply chain management. The Retail Link system, implemented in the mid-1980s, allows suppliers to directly access inventory levels and sales information across multiple stores. This enables suppliers to analyze product performance and manage their own inventory levels, effectively "hiring" thousands of product managers who have a vested interest in their products. Walmart's use of information technology has allowed it to drive prices down and respond quickly to market forces. The company's ability to innovate and integrate new technologies into its operations has become a competitive advantage, with suppliers often adopting new technologies simply because Walmart requires them to do so. What are some essential questions about information systems? They cover topics like hardware, Microsoft Windows, application software, people's roles, processes, and more. The personal computer was invented before the Internet, but restrictions on its commercial use were lifted in a certain year. Information technology expert Carr has a main argument that needs to be understood. To explain an information system to friends or family, one would define it as a set of components gathering, analyzing, maintaining, and distributing data. In a business organization, one component stands out as the most crucial for success: people. A personal experience can illustrate this point - in my previous job, a well-trained employee made a huge difference in customer satisfaction. Every day, we interact with various information systems at grocery stores, workplaces, schools, and even in our cars. These interactions involve technologies, people, and processes working together seamlessly. Do you agree that we are entering the post-PC stage of information system evolution? It's worth doing some original research to predict what business computing will look like in the next generation. Walmart is a great example of how information systems can make a company a leader - let's take a closer look at their recent innovations. By examining our own electronic devices, we can see the various components that make up an information system. In this chapter, we've covered the evolution of computing from mainframes to PCs and now smartphones. When thinking about information systems, what comes to mind? They have a significant impact on our lives and careers, whether we realize it or not. The fields of information systems (IS) and information technology (IT) overlap - they share common goals and components like hardware, software, networks, data, and procedures. Understanding the basics of information systems is essential in today's digital age. IT field focuses on technology processes like computer systems maintenance, whereas IS encompasses system processes including personnel involved, affecting all types of organizations' operations. In Pathanamthitta village, India, researchers used mobile apps to improve healthcare during the pandemic, leveraging IT for symptom reporting and telehealth, increasing care access to 60% of the geriatric population.