

The role of telecommunications, the internet, and wireless technology in improving the effectiveness of communications and organizational operations in the digital era

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ARTICLE INFO

Keywords:

telecommunications, Internet, wireless technologies, computer networks, organizational communication, operational efficiency.

Article history:

Received 2026-06-26

Revised 2026-06-30

Accepted 2026-07-04

ABSTRACT

The rapid advancement of information and communication technology has significantly transformed the way organizations conduct their operational activities. Telecommunications, the Internet, and wireless technologies not only serve as communication tools but also constitute the fundamental infrastructure for information management, work coordination, and organizational decision-making. This article aims to analyze the role of telecommunications, the Internet, and wireless technologies in enhancing communication effectiveness and organizational operations in the digital era. The study employs a library research approach by examining various concepts related to computer networks, the Internet, data communication technologies, and their implementation in modern business environments. The findings indicate that the integration of networking technologies enables organizations to improve operational efficiency, accelerate information exchange, expand communication reach, and facilitate real-time collaboration. Furthermore, the development of technologies such as Voice over Internet Protocol (VoIP), Unified Communications (UC), Virtual Private Networks (VPNs), and wireless technologies provides organizations with opportunities to reduce operational costs while enhancing workforce productivity. Therefore, the effective utilization of telecommunications and Internet technologies has become a strategic factor in establishing organizational competitive advantage amid increasingly complex global competition.

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1. INTRODUCTION

Digital transformation has transformed nearly every aspect of human life, including organizations and businesses. This change is marked by the increasing use of information technology as a primary tool for data management, communication, and decision-making. Modern organizations no longer rely on conventional communication systems such as mail, landlines, and faxes, but have shifted to network-based technologies that can connect various parties quickly and efficiently. Advances in telecommunications technology enable organizations to integrate various business activities into a single, digitally connected system. Through computer networks and the internet, information can be exchanged quickly, regardless of geographic distance. This creates new opportunities for organizations to increase productivity, accelerate work processes, and strengthen coordination between work units.

The internet, as a global network, has become a key infrastructure supporting business and educational activities. Various internet services such as email, video conferencing, instant messaging, and cloud-based data storage have transformed the way individuals and organizations interact. The advent of wireless technology further enhances communication flexibility by enabling access to information anytime and anywhere. On the other hand, increasing reliance on network technology also presents various challenges, such as the need for data security, managing complex network infrastructure, and the need to improve human resource competency in optimally utilizing these technologies. Therefore, an understanding of telecommunications, the internet, and wireless technology is crucial for organizations seeking to maintain their competitiveness in the digital age. Based on this background, this article discusses the basic concepts of telecommunications and computer networks, the development of the internet as a global infrastructure, modern communication technology, and its implications for the operational effectiveness of organizations.

2. METHODS

This article uses library research. Data were obtained from various literature sources discussing telecommunications, computer networks, the internet, and wireless technology. The analysis was conducted descriptively by interpreting relevant concepts to explain the role of communication technology in supporting modern organizational activities.

3. FINDINGS AND DISCUSSION

Telecommunication as the Infrastructure of Modern Organizations

Telecommunication is the process of sending and receiving information over a distance via electronic media. In an organizational context, telecommunications serves as the primary means of enabling the exchange of information between individuals, workgroups, and different organizational units. Advances in telecommunications technology have driven the integration of voice, data, and video communications into a single digital system. This integration enables organizations to reduce communication costs while increasing the speed of information delivery. Modern telecommunications systems enable activities such as virtual meetings, project coordination, customer service, and operational oversight to be conducted more effectively. The ability of telecommunications to connect various parties in real time makes it a crucial element in supporting organizational decision-making. The rapid and accurate acquisition of information enables management to better respond to changes in the business environment.

Computer Networks and Their Role in Information Management

A computer network is a collection of interconnected devices that share data, resources, and services. Networks enable organizations to manage information in an integrated manner, increasing work effectiveness. In practice, a computer network consists of various components such as servers, clients, switches, routers, and transmission media. Servers serve as central data storage and management centers, while client computers are used by users to access services available on the network. Utilizing computer networks offers various benefits to organizations. First, networks enable the rapid and accurate exchange of information. Second, they enable shared use of resources, reducing operational costs. Third, networks support collaboration between employees through various communication applications and document sharing. Furthermore, the development of the client-server concept has expanded organizations' capabilities in managing information systems. This model allows for a division of tasks between the server as the service provider and the client as the service user, thereby increasing data processing efficiency.

The Internet as a Means of Global Communication

The Internet is a global network that connects millions of computer devices worldwide. Its existence has fundamentally changed the communication patterns of society and organizations. In the business environment, the internet enables organizations to communicate across regions without geographical boundaries. Activities such as digital marketing, e-commerce, customer service, and even international collaboration can be conducted online. The development of the internet has also given rise to various services that support organizational activities, such as email, video conferencing, social media, and cloud-based services. These services enable the exchange of information quickly, cheaply, and efficiently. Besides being a means of communication, the internet also serves as a vast source of information. Organizations can use the internet to obtain market data, monitor competitor developments, and identify new business opportunities.

Packet Switching and TCP/IP Technology in Data Communications

One of the key innovations in the development of computer networks is packet switching technology. This technology allows data to be broken down into smaller packets that are sent over various communication channels before being reassembled at their destination. This approach makes network usage more efficient than traditional communication methods, which require dedicated paths during transmission. Furthermore, packet switching improves network reliability because data packets can choose alternative paths if a disruption occurs on one of the communication channels. The success of the internet as a global network is inextricably linked to the use of the TCP/IP standard. This protocol governs how data is sent, received, and processed by various devices connected to the network. With a common standard, devices from different manufacturers can communicate with each other without technical barriers.

The Role of Wireless Technology in Organizational Mobility

Wireless technology is an innovation that offers high flexibility in communication and information access. Unlike wired networks, which require physical installation, wireless technology uses radio waves to connect devices. The use of Wi-Fi technology, cellular networks, and mobile devices allows employees to access organizational information systems from various locations. This greatly supports the implementation of flexible work and remote collaboration. In the industrial world, wireless technology is also used to support inventory tracking systems, production monitoring, and logistics

management. Implementing RFID technology integrated with wireless networks allows organizations to monitor the movement of goods in real time, thereby improving operational efficiency.

Voice over Internet Protocol (VoIP) and Unified Communications

Voice over Internet Protocol (VoIP) is a technology that enables voice communications over the internet. This technology offers several advantages, including lower communication costs, flexibility of use, and ease of integration with an organization's information systems. In addition to VoIP, technological advancements have also given rise to the concept of Unified Communication, which integrates various communication channels into a single platform. This system allows users to access email, instant messaging, video conferencing, and telephone services from a single interface. Communication integration has a positive impact on organizational productivity because it facilitates coordination, speeds up decision-making, and increases teamwork effectiveness.

4. CONCLUSION

Telecommunications, the internet, and wireless technology have become key components in supporting the activities of modern organizations. The use of computer networks enables the exchange of information quickly, accurately, and efficiently. The internet provides a global infrastructure that supports cross-regional communication and collaboration, while wireless technology provides high flexibility in information access. Various innovations such as packet switching, TCP/IP, VoIP, and Unified Communication have improved organizations' ability to manage communications and business operations. Therefore, mastering and utilizing communications technology is a crucial factor in creating organizational effectiveness and maintaining competitiveness in the digital age.

REFERENCES

- Comer, Douglas. *Internetworking with TCP/IP: Principles, Protocols, and Architecture*. 6th ed. Boston: Pearson, 2015.
- Forouzan, Behrouz A. *Data Communications and Networking*. 5th ed. New York: McGraw-Hill, 2013.
- Kurose, James F., dan Keith W. Ross. *Computer Networking: A Top-Down Approach*. 8th ed. Boston: Pearson, 2021.
- Laudon, Kenneth C., dan Jane P. Laudon. *Management Information Systems: Managing the Digital Firm*. 16th ed. New York: Pearson, 2020.
- O'Brien, James A., dan George M. Marakas. *Management Information Systems*. 10th ed. New York: McGraw-Hill Education, 2011.
- Stair, Ralph, dan George Reynolds. *Principles of Information Systems*. 13th ed. Boston: Cengage Learning, 2018.
- Stallings, William. *Wireless Communications and Networks*. 2nd ed. Upper Saddle River: Pearson, 2005.