Business Security Threat Overview Using IT and Business Intelligence

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ABSTRACT

Through a critical reflection on how information systems (IS) are currently defined in the IS literature, this study aims to contribute to a more profound knowledge of information systems (IS). The research identifies a number of definitions of IS that may be found in the literature by employing the hermeneutic method for literature reviews. The examination of these definitions allows for the differentiation of four distinct perspectives on information systems (IS): a technology view, which emphasizes the technological aspects of IS; a social theory, which highlights the sociocultural factors of IS; a socio-technical view, which emphasizes the interconnection of technology and social elements; and a process view, which emphasizes the activity orientation of IS. This study critically examines the many methods of understanding and conceptualizing information systems and explores their contributions and limits. Based on this examination, the paper argues for developing an alternative socio-material understanding of IS based on a non-dualist, relational ontology.

Key Words: Information Systems, Management Strategy, Business Intelligence, Database Infrastructure, Security Threats

INTRODUCTION

An information system is an integrated collection of components used for data collection, storage, and processing, as well as providing us with information, knowledge, and digital products. Information systems are essential for businesses and other organizations to successfully carry out and manage their operations, communicate with customers and suppliers, and compete effectively in the market (Lal & Ballamudi, 2017). Information systems are utilized to control the supply chains and electronic markets that exist between different organizations. Businesses use information systems for various purposes, including processing financial accounts, managing human resources, and disseminating Internet advertisements to potential clients (Gutlapalli, 2016a). Many of the world's most successful businesses are predicated exclusively on information technologies (Lal, 2015).

COMPONENTS

A fundamental breakdown of an information system reveals its five constituent parts: hardware, software, database, network, and humans (Li, 2011). Input, processing, output, feedback, and control are the five functions performed by integrating these five components.

- The input/output device, CPU, operating system, and media devices are all considered part of the hardware.
- Software is made up of a variety of different applications and processes.
- The data are stored in the database in an organized fashion according to the prescribed format.
- The components that make up a network are referred to as hubs, communication medium, and network devices.
- The people include people who operate devices, administer networks, and specialize in systems.

Input, processing of data, data storage, output, and control are the components that makeup information processing. During the input stage, data and instructions are provided to the systems, which are then processed by software programs and other queries during the step known as the process stage (Gutlapalli, 2016b). The output stage involves presenting the data in an organized format and various reports.

CLASSIFICATION

Any business can classify information systems by utilization. An organization's information system can be separated into operations and management support systems.

- **Support system:** End-user data is processed to provide reports for internal and external users in a company. These are called operation support systems (Qin, 2014). The operation support system eases business transactions, controls production, supports internal and external communication, and updates the central database. The operation support system includes transaction processing, processing control, and corporate collaboration systems.
- **Transaction Processing System:** Manufacturing organizations have many cross-departmental transactions. Typical departments include sales, accounting, Finance, Plant, Engineering, HR, and Marketing. Sales orders, returns, cash receipts, credit sales, credit slips, material accounting, inventory management, depreciation accounting, etc. These transactions can be batch, single, or real-time.
- **Process Control:** Computer systems need human participation in production to make choices. This system controls processes by receiving critical data in real-time. These are process control systems.
- **Collaboration System:** Recent emphasis has been on cross-functional teamwork. Enterprise collaboration systems improve communication and data sharing to facilitate cooperation.
- **Management Support:** Managers need precise, formatted data to make organizational decisions. A management support system helps managers make decisions efficiently. Information systems, decision systems, expert systems, and accounting information systems are management support systems. Managers use management information systems to make regular decisions (Dekkati et al., 2016). A decision support system helps managers solve specific issues.

TECHNOLOGY AND INTELLIGENCE

Following the decade of the 1990s, the commercial world saw a significant upheaval. All companies in every conceivable industry sector have started implementing information technology to boost their production and profitability levels (Abdisalam, 2011). Along with the products and services they provided customers, businesses began using other technological advancements such as mainframes, personal computers, telephones, and the Internet (Lal, 2016). This method has become the fundamental building block for the development of information technology. The information technology industry has seen a massive uptick in the amount of capital invested in it.

A DRIVING FORCE OF PRODUCTIVITY

GDP has increased in recent years, and the US economy is expanding. Labor demand has increased, and inflation is low. Economists need clarification on the price freeze. Traditional ideas predict that price pressures increase with economic expansion and unemployment fall. "Productivity" means using productive inputs to produce output. When men, machines, and materials are used efficiently, expenses can be managed, and firms may offer reasonably priced goods and services (Shi, 2011). By merging cutting-edge IT with business tactics, companies may boost efficiency. Business strategy includes establishing target markets and consumer preferences and controlling production and delivery. Information technology allows corporate executives and decision-makers to create economic-based business plans. Information flows to decision-makers and employees across a business. Managers can quickly analyze the following operations using effective IT. They are:

- Production
- Marketing/advertising
- Customer relationship management
- Distribution
- Finance
- Human Resource
- Telecomm and network processes

Businesses are already using IT to improve productivity. Information technology has also advanced computer speed and memory. This has enabled powerful, cutting-edge software.

The internet benefits from new telecoms technologies. All these technologies have produced a massive information network that is an organization's pulse.

BUSINESS INTELLIGENCE

The acronym "Business Intelligence" (BI) refers to the methods and technologies that transform raw data into understandable and helpful information. These methods allow for managing enormous amounts of unstructured data, enabling the discovery and development of new commercial prospects. The primary objective of business intelligence is to simplify the interpretation of the data for the user. Organizations can acquire a competitive advantage in the market and long-term stability by utilizing the insights supplied by business intelligence tools.

The transformation of these raw or unstructured data into information with added value results in increased business knowledge held by personnel of all types working within an organization. The people who make decisions utilize these data to apply a variety of different company strategies that are based on economic theory (Mandapuram, 2016). Managing the available resources to meet the end user's requirements is also simple.

Business Intelligence Functionality

Standard functions of Business Intelligence are:-

- Reporting
- Online analytical processing
- Analytics
- Data mining
- Process mining
- Business performance management
- Predictive analysis; &
- Prescriptive analysis

SYSTEMS AND TECHNOLOGY

It has been seen quite frequently that the terms information technology and information system are utilized interchangeably. Information technology is a subset of information systems, to use the term in its most literal sense. People, procedures, machines, and information technology are the components that makeup information systems. The introduction of computers and subsequent developments in information technology are to thank for the significant progress made in information systems.

- **Information System:** A set of coordinated network components that work together to produce, distribute, or process information can be called an information system. This type of system can be characterized as a set (Traian & Cristian, 2011). The information obtained via computer-based information systems is characterized by a vital quality called precision, which may not be present in other types. It is possible to categorize an information system in every given organization according to the function that the information serves. As a consequence of this, information systems in businesses can be classified as either management support systems or operations support systems.

- **Information Technology:** Everyone uses IT daily, intentionally or unknowingly. It has developed swiftly and affects movies, mobile phones, the Internet, and more. Information technology combines computers and telecommunications to store, retrieve, manipulate, and save data.IT Association of America defines IT as the "study, design, development, application, implementation, support or management of computer-based information systems. “Information technology boosts economic performance, solves social challenges, and makes information systems economical and user-friendly. Information technology has transformed education, home life, employment, communication, and governance.

- **Comparison of Information System and Information Technology:** Information systems and IT are comparable but distinct. The following are information system and technology aspects. In the pre-mechanical age, information systems began as books, sketches, etc. Information technology generally started with the invention of computers. Development: Information systems have evolved from manual record-keeping to cloud storage. Information technology is also changing with faster processors and smaller storage devices. Businesses use information systems like manual books of accounting to modern TALLY. Email has replaced letters as a form of communication. Information technology has increased productivity and precision manufacturing across the firm.

- **Future of Information Systems and Information Technology:** Information technology has grown exponentially in the past decade, creating more advanced systems. Information technology has dramatically enhanced life. Modern medicine benefits most from better information systems using the newest technology. Humans have used information systems for decision-making. Information systems became advanced with information technology, and their use spread across many fields. It helps handle enormous amounts of data into meaningful information.

MIS Can Help Companies Grow

A functional management information system is necessary to maintain company manager productivity. It makes workers labor hard all week without guidance. A competent MIS provides the data needed to identify underperforming areas of the organization. Management information systems offer certain benefits:

- **Boosts employee productivity:** Employees will be more productive when a management information system is in place because they will not have to obtain management-requested information (Wu et al., 2010). A well-organized management information system will gather all the data without worker input. Information processing costs, errors, and time have been reduced using MIS. Online transaction processing (OTPS) can boost productivity in a management information system. OTPS collects, analyzes, and updates data to gain meaningful insight from processed data. MIS also increases efficiency by letting clients utilize a custom integrated system (CIS) to process their transactions.
- **Improves company decision-making:** A management information system increases data availability, lowering uncertainty and enabling managers to make better ratio quality decisions. Management facts The System analyzes a problem and delivers all the essential facts, then expects us to choose. It also provides advice on decisions.
- **Streamlines communication across organizational departments:** When employees, department heads, and managers share information, they better communicate, identify issues, and find solutions. MIS coordinates departmental and team communication. A collaborative MIS improves teamwork in a company.
- **Helps increase efficiency:** A functional management information system allows managers to recognize an organization's strengths and flaws. This will boost company efficiency.
- **It explores many scenarios for various economic environments and alternatives:** An effective management information system lets managers investigate numerous options to assess results before making commitments and choices.
- **Increases an organization's competitive edge:** Managers may run a more efficient business with a standard MIS, eliminating vulnerabilities and underperforming areas. Ultimately, the company will gain a competitive advantage over its competitors.
- **Increases client data:** A management information system will provide more consumer information, which will help management improve customer service and produce highly successful promotional and marketing efforts.

INFRASTRUCTURE AND DESIGN OF THE INFORMATION SYSTEM

When new business or administrative initiatives are introduced, an information system that has been thoughtfully designed will have a consistent base, which will support change that is responsive and will, as a result, support the organization's agility. The foundation is made up of essential telecommunications networks, databases and data warehouses, software, and hardware that are maintained by a variety of professionals. This foundation is referred to as the information system infrastructure. As a result of globalization in business, the infrastructure of an enterprise will frequently span numerous national lines. To successfully handle strategic business initiatives, transformations, mergers, and acquisitions, substantial preparation and consistent implementation are necessary before establishing and sustaining such a complex infrastructure (Desamsetti, 2016a). The information system's infrastructure should be developed to generate relevant choices for the company's continued growth.

The specific information systems that support an organization's operations, management, and knowledge work constitute its system architecture when structured into a coherent whole. When creating an information system's infrastructure and architecture, it is abundantly clear that one must consider an organization's long-term general strategic plans.

MANAGEMENT OF THE INFORMATIONAL SERVICES ORGANIZATION

An external company, an internal department, or a combination of the two may provide a company's information services. Sometimes, both types of providers work together. Outsourcing information services is beneficial for achieving various business goals, including cost reduction, access to superior talent, and a concentration on core capabilities (Walker et al., 2007). Typically, an organization will delegate responsibility for its information systems to a unit known as information services. This unit is of a modest size when the systems are mostly outsourced, and its primary focus is aligning the designs with the corporate competitive strategy and supervising the services provided by the outside company. When information services are supplied internally and centralized, the responsibility for developing, acquiring, operating, and maintaining information systems for the entire organization falls on one particular unit. In decentralized structures, on the other hand, the central unit's only responsibility is the infrastructure's planning and maintenance. Other business and administrative professionals supervise the systems and services utilized by their respective teams. There is a wide range of conceivable organizational types that are intermediate. A CIO or CTO often oversees an organization's information technology infrastructure. Typically, the activities of information services are managed by a steering committee comprising executives from various functional areas within the firm. Steering groups determine the goals and objectives of the development of future systems (Thaduri et al., 2016). Boards of directors need to be active in the governance of information systems in those kinds of businesses where they have a strategic role in the organization. As will be seen in the following description, one of the most critical responsibilities of an information services unit is to guarantee that there will be no interruptions in service while maintaining the integrity of the systems and information.

INFORMATION SYSTEMS SECURITY AND CONTROL

Security issues have moved to the forefront of global well-being due to the opening of information systems to the worldwide Internet and their thorough infusion into the operation and management of business and the infrastructure of daily life worldwide.

- **Protection of information technology systems**: The security of information systems is in charge of maintaining the honesty and safety of the system's resources and operations. The successful operation of information systems is critical to the success of most enterprises in developed countries. The fundamental foundation of communities frequently hinges on this type of security. Operating several infrastructure grids, including those that provide power, water, and medical services, is essential. Information systems serve as the central nervous system of intensive care units and the systems that govern air traffic. A complete breakdown of the information systems supporting financial institutions could not be tolerated for more than a day or two. The acronym EFTS stands for electronic funds transfer systems. These systems manage enormous sums of money only as electronic signals transmitted across networks or as spots on storage drives. Information systems are susceptible to various risks and necessitate stringent controls, such as ongoing countermeasures and routine audits, to guarantee the system's continued safety in the face of these dangers. Instances of computer crime and abuse garner a significant amount of attention from the media. However, it is estimated that human mistake is the source of higher losses in the functioning of information systems. As a component of a company's overall strategy for maintaining commercial operations, disaster recovery planning focuses on mitigating the effects of natural catastrophes such as earthquakes, floods, and fires (Desamsetti, 2016b). If software, servers, or communications networks fail to function correctly, it is essential to have a backup plan in place.

- **Misuse of and offenses using computers:** Computer crime costs the global economy billions annually (Laurie & Roberts, 2008). Computer abuse is unethical but not a crime. Information system hacking targets vandalism, consumer data theft, government and commercial espionage, sabotage, and cyberwar. Phishing and malware, including viruses, worms, Trojan horses, and logic bombs, are common computer crimes. Phishing includes deceiving users into giving up their login and other information by pretending to be from banks or government agencies. A successful phishing attack may lead to identity theft, impersonating users to access their resources. Computer viruses are typical attacks. These program instructions can do harmful behaviors and insert copies of themselves into other programs to increase to other computers. Worms, like viruses, are entire computer programs that spread via telecommunications networks (Ballamudi, 2016; Dekkati & Thaduri, 2017). Viral and worm pests can cause massive damage because of their fast spread. Damage can include system manipulation, data breaches (stealing vast amounts of data like credit card details), or denial of service by flooding systems with bogus requests.

  Trojan horse attacks hide malicious code in legitimate programs. A logic bomb uses Trojan horse-style concealed instructions that lay dormant until a specified event occurs, then activate. A Fort Worth, Texas, insurance industry programmer placed a logic bomb in the company's human resources system 1985. When he was sacked, and his name was wiped from the employee database, the entire database was purged. If an Internet-connected machine is infiltrated, it can take over many others and establish botnets that can launch enormous attacks on other systems to steal data or harm them. In the "Internet of Things," botnets may use computer-controlled items like refrigerators and TVs. Malware control is challenging due to device variability.

- **Controls over information technology systems:** Controls are a collection of processes and technological measures an organization implements to ensure its information systems' operation is safe and effective. Both broad and application-specific controls are used in conjunction with one another to protect information systems. Controls of a general kind are applied to the actions of an information system throughout an organization. The measures that regulate access to computer systems and the information that is either kept on such plans or transferred over telecommunications networks are among the most critical and essential general controls. Controls at the public level comprise administrative measures that limit employees' access to only those tasks and procedures that are immediately pertinent to their responsibilities.

  Consequently, these measures reduce the damage that may be caused by a single employee or by an imitation of an employee (Petrevska et al., 2015). Computer systems designed to operate in critical environments, such as those in hospital information systems or securities marketplaces, are known as fault-tolerant computer systems. These systems are built to manage and isolate faults so the design may continue operating normally. Activating backup systems in faraway places may be necessary if the primary information system fails. Program controls are unique to a particular program and contain safeguards like validating input data, logging system accesses, routinely archiving copies of various databases, and ensuring that information is only shared with those allowed to receive it.

- **Protecting confidential information:** With the proliferation of wide area networks (WANs) and the Internet, controlling access to information systems has become highly challenging. Users and unauthorized users can access systems using nearly any unattended computer within an organization or the Internet from anywhere. As an additional layer of protection, every genuine user has a one-of-a-kind name and a password that is frequently updated. A fingerprint, retinal pattern, hand shape, or signature are all human characteristics that can be used for identification in addition to a physical token or smart card. Requiring some physical authentication is yet another security precaution that can be implemented. Using a PIN in conjunction with an identification card is every day in many systems, such as automated teller machines (ATMs), which rely on this combination of security measures. This method has become increasingly important in the realm of online business. Encryption with public keys is a common practice in this kind of business. Messages encrypted using the intended addressee's public key can only be decrypted if the intended addressee possesses the private key necessary. This is done to protect the secrecy of the information.

  Additionally, authentication of both parties in an electronic transaction is feasible through digital certificates issued by a trusted third party and digital signatures, which are an additional code added to the message to verify its origin. Both of these methods are discussed further in the following paragraphs. In addition, an ant tampering code can be appended to a letter to establish whether or not it has been altered. Various comparable ways are available to guarantee that parties to an electronic transaction cannot afterward deny participating. Specific messages call for additional attributes to be provided. For instance, a payment made in electronic cash is a form of notice that functions like physical cash. This message is encrypted to protect the anonymity of the purchaser. Intrusion detection systems are utilized to carry out ongoing monitoring of information systems. They look for strange occurrences, log the information required to make reports, and determine the origin

and type of any potential intrusions. In addition, more active systems try to stop the infiltration as soon as it is discovered in real-time.

- **Conducting audits of information systems:** An information systems audit examines the efficacy of the controls implemented inside an information system (Kristian et al., 2013). The purpose of an audit is to determine whether or not information systems are protecting business assets, preserving the integrity of data that is stored and conveyed, contributing successfully to the achievement of corporate objectives, and running as efficiently as possible. An organization's accounting records and financial statements are checked for accuracy as a component of a more comprehensive financial audit. Information systems are built so that each monetary transaction can be traced back to its sources. In other words, there needs to be some audit trail to determine where each transaction began and how it was handled when it was processed. In addition to financial audits, operational and technological audits are used to analyze the efficacy and efficiency of the operations of information systems. Specialized audits check to ensure information technologies are selected, configured, and implemented effectively.

CONCLUSION

The article analyzed MIS system success factors. Design process, customers, and business requirements affect MIS effectiveness. The studies also demonstrate that staff expertise is crucial to MIS installation success. However, private and public sectors face different obstacles. Although working toward the same goal, businesses and stakeholders offered additional hurdles for the public. Understanding who will utilize the MIS system and its environment, including process and people, is another essential part of MIS design. The proper study organization approach in a sector is vital before using MIS. The large number of stakeholders (decision-makers) makes system characteristics challenging to choose. The MIS system is fantastic, but IT skills may prevent its implementation. In conclusion, businesses can employ management information systems if they follow systematic and proper orientation guidelines. It ensures management information systems facilities are appropriate and sufficient in producing and communicating information like activity reports, which can be monitored, handled, and distributed to management, supervisors, employees, and clients for better decision-making and approval in each organization.

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