Information systems infrastructure: core components of organization

Evgeny Soloviov[a], Alexander Danilov[b]

[a]Laboratory of Innovating Engineering, Krasnoyarsk, Russian Federation,

[b]Siberian Federal University, Institute of Petroleum and Natural Gas Engineering, Krasnoyarsk, Russian Federation.

Corresponding author.
Correspondence: Evgeny Soloviov
E-mail: e.a.solovyev.1@gmail.com

Abstract

The present study highlights the role of information system infrastructure which is reported to be the backbone of any organization. It is the important components of the system in managing business and its application. The study provides the hinging of information sciences with management system

1. INTRODUCTION

Today information systems are important in every organization [1]. The word infrastructure refers to the basic supporting systems that are shared amongst users. In this context, the information technology infrastructure is a simply shared platform for all business applications. The management of technology is here seen as a critical success factor for many operations and even in this COVID 19 situation, the world is dependent on information tools [2, 3]. In other forms, should there be any problems with information systems the impacts can be instant and very expensive from a financial perspective? For example, sales cannot be properly done if the sales systems are down.

2.UNDERSTANDING INFRASTRUCTURE :

Information technology infrastructure can be seen as the basic technological platform for other systems that are used in various business activities, security, privacy and processes [4]. We observe In most organizations, technological infrastructure is the enabling foundation upon which business depends. Consequently, advancements in information technology affect the development of the organization's IT infrastructure and services that are based on it. Let us look at the information technology infrastructure in more detail. There are several dimensions to information technology infrastructure

1.Embeddedness: infrastructure is part of other technologies, organizational and social structures. Learned as a part of membership: Infrastructure is specific to every organization. New staff members learn about the infrastructure and gradually get familiar with it.

2.Transparency: Information technology infrastructure is expected to be transparent in the sense that it does not have to be separately invented or modified for each application. Becomes visible upon breakdown: Mostly transparency of the infrastructure disappears immediately if the infrastructure fails to deliver as expected.

3.Reach and scope: infrastructure extends beyond a single place, process or event; it is intended serve over a long period, time, in many locations, and for a variety of purposes. Role of standards: standards are a vital part of the infrastructure. Standards make it possible to expand the system and connect it to other infrastructures, like those of other organizations. Built on an installed base: development of infrastructure is gradual, it is built and based on existing infrastructure, and is therefore dependent on its strengths and limitations.

4.Based on conventions of practice: Information technology infrastructure is shaped through organizational practices and vice verses.It is known that Information technology infrastructure is a concept that can further be divided into two related components: technical IT infrastructure and human IT infrastructure. More often information technology is seen only as a combination of different technical devices. The technical component includes different devices that connect computers and systems, mainly networking devices. And also, servers, systems, and devices that are commonly shared among users are considered to be part of technical information technology infrastructure. The human component is a vital part of the information technology infrastructure. It consists of individual and organizational skills, expertise, competencies, and commitment. According to Lee et al. human information technology infrastructure is a combination of expertise in four areas: i. Technology management.

        ii. Business management.
        iii. Technical issues.
        iv. Interpersonal skills and management.

i.Technology management refers to an organization's ability to deploy information technology in a way it enables and supports business targets.

ii.Business understanding is very close to the technology management as when it comes to understanding business processes is vital for selecting the right technologies, systems, and applications that make it possible to meet business needs Business knowledge is needed to develop technical capabilities so that business targets, operative, and strategic goals can be met.

iii.Development of technical infrastructure is seldom possible without technical knowledge, basic understanding in areas such as software development, data communications, together with hardware and software technologies. IT staff should have both broad and deep technical knowledge. Especially in smaller organizations, IT departments are small, and therefore IT staff is challenged to know a wide range of different technologies and systems. At the same time, it should be remembered that also interpersonal skills are increasingly important in information technology management.

iv.Development activities require an understanding of business needs and user requirements, and without sufficient communicative skills development may not be as successful as it could be. Information technology infrastructure can also be seen as a combination of technology, procedures, and knowledge, which ultimately materialize in services that support business processes. New innovative technologies and more advanced IT components are being developed. Here the organization's understanding of how to best utilize these technologies, together with advancements in IT components, allows existing and new services that can be developed within an organization for business purposes. As a potential, understanding the technological opportunities and benefits of information technology in the organization is vital. Information technology infrastructure is developed over a long period through interaction between people and technology. It is for more organization-specific, and cannot directly be copied or imitated. Some components of the infrastructure are shared widely, among different levels of users and processes [1]. Information technology should,

therefore, be flexible and open for changes, although infrastructure should be relatively stable, robust and basis for operations and applications

5.CHALLENGES:

The challenge of information technology management is to develop the information technology infrastructure to support operative and strategic goals. This requires an understanding of business needs and requirements, together with technical knowledge. The organization must set and follow a strategy in all its operations, also in information technology management. The information systems should meet short-term business needs today, and at the same time, it should be a platform that enables the development of long term capabilities. Now, this compatibility of technology is a key issue; it allows flexibility in the future. Also, reliability is essential in all infrastructures and information systems. In general, users expect the systems to function as correctly and reliably as possible. This is also referred to as trustworthiness. In general, developing an IT infrastructure that supports operations is a challenging task, taking into account the fact that business processes can put great demands on the robustness and flexibility of the underlying infrastructure. It is also possible that the external environment changes, and prompts rapid changes in business operations [5,6].

Development of information systems that allow flexibility and robustness involve considering key 'network variables' in infrastructure.

Capability: what type of business activities does infrastructure support?

Flexibility: how far easy is it to modify the infrastructure to respond to changing needs?

Quality of service: what is the reliability of the infrastructure?

Cost: what are the costs of infrastructure, and are the benefits worth the investments?

Information systems are expected to meet business needs. These requirements should be the guidelines in designing the level of capabilities, services, and their quality, and flexibility of the information technology infrastructure. All this should be made possible at reasonable costs. Many additional aspects that need to be taken into consideration in information technology development are reliability, performance, and accessibility [5-8].

Accessibility refers to the extent and reaches of infrastructure, in the sense that where one can access the system and what terminal devices can be used here. When access is possible with a wide range of devices ranging from desktop computers to portable devices, tablet computers, and smartphones independently of their operating systems infrastructure are seamless and do not limit operations. In other words, if only certain geographical locations, terminal devices, or operating systems can be used in accessing the information systems this can severely affect the way people do their work. It also impacts the flexibility to organize things differently and to adapt to changes in business needs [9-11].

6.DEVELOPMENT IS BASED ON STANDARDS

Organizational development and the potential for new business opportunities are impacted by information systems, or depend on them. In this way also business people need to be involved in the development of infrastructures. As a result, existing information systems, technologies, and infrastructures are the starting point for any infrastructure development process. It is a relatively rare case where the system is being from scratch, without any existing technologies. This takes place only when a new company is starting operations. However, in other cases development of information technology infrastructures is influenced by the existing technologies and platforms. This affects development activities in two ways. Mostly, whether the choices are

about hardware or software it is important to look at the compatibility of new solutions with existing technologies. Technology also has a 'mediating role' between development-related activities and the actors who are involved in the development work. It brings different kinds of people and stakeholders together and is a topic for various discussions. Noteworthy, technology does not affect technical staff alone. Understanding the business impact of technologies is not necessarily one of the areas where IT people excel. From a business perspective, it is very important to have business people involved in development. In general, information technology infrastructure acts as a foundation for business processes and activities. Infrastructures are being developed over a long period when new technologies and systems are being installed to an existing base of technology. This type of incremental and additive development makes compatibility, standards, and standards compliance of the existing and future infrastructure cornerstones of infrastructure development. Changing to a technology that does not follow standards can be unwise if it is not compatible with the existing infrastructure. When the number of users grows, people become familiar with an existing system, and the relative importance of the system increases switching to an alternative that risks compatibility will become increasingly unlikely [9-14].

7.Role of Flexibility

Flexibility is defined as the degree to which an organization possesses procedures that it can implement in response to changes happening in the environment. Moreover, flexibility is characterized by issues like connectivity, compatibility, and modularity. Connectivity relates to the ability to attach technologies with other technologies, devices, and systems whereas compatibility refers to the ability to share information across the information system. In an ideal situation, systems should be integrated transparently so that data can be accessed, processed, and shared regardless of the systems and technologies used in the process. There are continuous changes in technology. As a result, systems should be modular so that it is possible to add, remove, or modify different components in the system. slight modifications should be possible with little or minimal impact on other systems. The ability to modify, add, or remove system modules is also called application functionality. When changes are possible without significant technical or operational problems the costs involved in changes can be kept at a reasonable level. Finally, from this perspective, flexibility is also connected with costs and profitability [15-17].

8.Information technology infrastructure flexibility is important for many reasons:

Infrastructure should connect different technologies and systems . to do this successfully, there is a need for flexibility that allows the integration of different systems into one network. Combined with the fact that there is also increasing pressure to develop interfaces to information systems of other organizations, for example connecting with suppliers or significant customer organizations information systems to streamline processing of orders. Secondly, as information technology should support operations there needs to be a tight connection between vision, strategies, and business targets with the developers of information technology. Most typically an information technology infrastructure is intended to serve for several years and be relatively stable over time. At the same time requirements for business operations and processes may change, and this calls for changes in information technology infrastructure. The reason is Because of a long time of infrastructure, there is a need to modify systems, add new applications and technologies into existing infrastructure to meet the changes within the organization and its environment. Thirdly, the development of technology and applications generates a need for change. A small example, upgrading an application may lead to problems with other systems. Here flexibility, changes, and adjustments are needed to keep the system functioning as smoothly as possible. It is also common that systems expand as business grows. Adding new users, workstations, systems, and services are required for information technology infrastructure [16-18].

CONCLUSION:

Technology is expected to work transparently, as a reliable basis for business operations. It is still noteworthy that despite ever-increasing sophistication of technology it is not enough for successful business operations as technology also needs to be converted into productive outputs. Knowledge and experience are needed to use, maintain, and develop technology to meet business needs. The Human component is, therefore, a vital part of successful information technology infrastructure .

References:

1. RR Nadikattu, 2016 THE EMERGING ROLE OF ARTIFICIAL INTELLIGENCE IN MODERN SOCIETY. International Journal of Creative Research Thoughts. 4, 4 ,906-911.
2. RR Nadikattu, Rahul Reddy and Mohammad, Sikender Mohsienuddin and Whig, Pawan, Novel Economical Social Distancing Smart Device for COVID-19 (July 1, 2020). International Journal of Electrical Engineering and Technology (IJEET), 2020, Available at SSRN: https://ssrn.com/abstract=3640230
3. Irimia R, M. Gottschling , Taxonomic Revision of Rochefortia Sw. (Ehretiaceae, Boraginales). Biodiversity Data Journal 4: e7720. Https://Doi.org/10.3897/BDJ.4.e7720." DOI:10.3897/bdj.4.e7720.figure2f. (2016).
4. "Information Systems Infrastructure: Evolution and Trends: [Essay Example], 570 Words GradesFixer." GradesFixer, gradesfixer.com/free-essay-examples/information-systems-infrastructure-evolution-and-trends/.
5. "Management Information Systems (MIS)." Inc.com, Inc., www.inc.com/encyclopedia/management-information-systems-mis.html.
6. Zass, Vladimir. "Computer Crime and Abuse." Encyclopædia Britannica, Encyclopædia Britannica, Inc, www.britannica.com/topic/information-system/Computer-crime-and-abuse. (28 Dec 2017).
7. M. Broadbent, P.Weill, T. Brien and B. Neo, Firm Context and Patterns of IT Infrastructure Capability (Best Paper Award). ICIS. (1996).
8. M.D. Stanton, Information Security Reading Room Integrating Wired and Wireless IDS Data. (2019).
9. D. Landmann, Capacity development of small-scale farmers in developing countries: Analysis of preferences and the role of information and communication technologies. (2018).
10. J.M.Pearce, L.Grafman, T.H. Colledge and R. Legg, Leveraging Information Technology, Social Entrepreneurship, and Global Collaboration for Just Sustainable Development. (2019).
11. D. Sun and Y.Yuan, Cooperative Innovation, Information Technology Application and Industrial Upgrading. DEStech Transactions on Social Science, Education and Human Science. (2019).
12. Vij, Role of Information Technology in Policy Implementation of Maternal Health Benefits in India. (2016).
13. Age and G. Andrew, Adult Education and Technology in a Rural County: The Irony of Persistent Poverty and a•YProgressa•Z in the Information Age. (2019).
14. P.A. Sadorsky, Organizational Slack in the Global Information Technology Industry. (2020).
15. A.Tolk, Using Simulation Systems for Decision Support. (2019).
16. Z.X .Feng, Application and Development Model of Image Recognition Technology in Medical Field. (2019).
17. V.Mojtahed, M.Eklöf and J.Zdravkovic, 16th ICCRTS "Collective C2 in Multinational Civil-Military Operations" Title of Paper Towards Semantic Interoperability between C2 Systems Following the Principles of Distributed Simulation Topic(s) Networks and Networking Architectures, Technologies and Tools C2, Management, and Governance in Civil. (2011).
18. RR Nadikattu. 2017. The Supremacy of Artificial intelligence and Neural Networks. International